

SD Times

SOFTWARE DEVELOPMENT

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CODE, CONTENT COLLIDE FOR IMPROVED QUALITY

Rational, StarBase offerings take expanded view of traditional application life cycle

BY DAVID RUBINSTEIN

The worlds of code editing and Web content management are moving ever closer together, with recent announcements by Rational Software Inc. and StarBase Corp. that they will extend their code editing and change management tools to work in conjunction with Vignette Corp.'s V/5 Content Management Server.

"The new era of content management calls for developers and content managers to be working together," said Bill Daniel, senior vice president of products at Vignette (www.vignette.com).

"I don't believe content management as a market can stand on its own. It will go away."

Daniel said that traditional software configuration and document management companies will have to move in the direction of integration to survive. To that end, Vignette will be announcing this month its vision of extended content management, which widens the traditional definitions and lets all team members—from Web designers, content editors and developers—know how they fit in.

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Mainsoft Takes Visual C++ To New Ports

Visual MainWin targets Linux, Unix with Win32 run-time environment

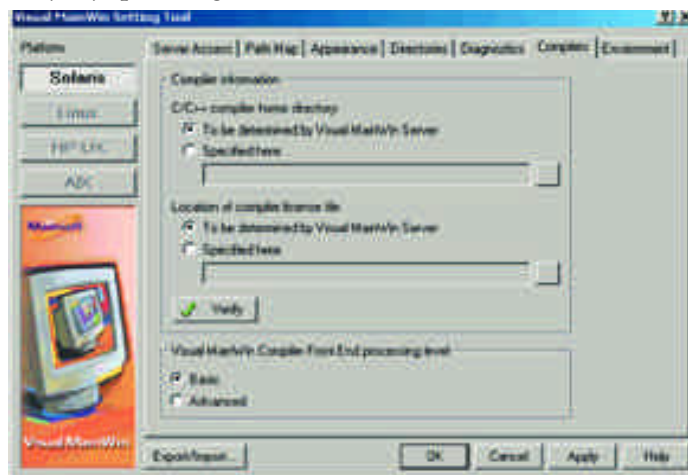
BY DAVID RUBINSTEIN

Porting 32-bit Windows programs to Linux and Unix has been a labor-intensive task. Mainsoft Corp. believes it can make the job easier with its new Visual MainWin, a cross-development platform that it says provides "compile once, deploy simultaneously" capability by providing a Win32

run-time environment on the target platforms.

Released last month, Visual MainWin, which the company says is seamlessly integrated with Visual Studio 6, allows Visual C++ developers to write their applications and target other platforms by recompiling the Windows source code with

► continued on page 30



Visual MainWin targets the platform onto which applications will be ported.

Java Jolts Embedded Systems Conference

New embedded virtual machines, tools steal the show

BY EDWARD J. CORREIA

SAN JOSE, CALIF. — With the pervasiveness of Java, it should come as no surprise that it is finding its way into more embedded designs. And while only a small number of the exhibitors at this year's Embedded Systems Conference were showing Java solutions, those that did garnered much of the spotlight.

Software tools developer NewMonics Inc. was showing PERC 3.1, an updated version of its integrated development environment and run-time modules for embedded sys-

tems. The company claims it has developed a clean-room Java Virtual Machine that optimizes memory usage and permits developers to debug compiled code in deployed applications



using any combination of interpreted or compiled code. The advantage to developers, the company said, is greater debugging flexibility for embedded applications.

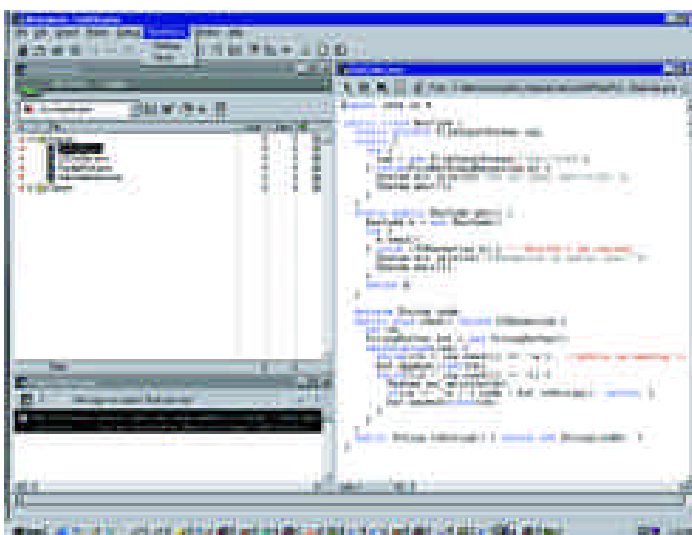
According to Kelvin

Nilsen, CTO of NewMonics (www.newmonics.com), his company's JVM is more reliable than others because of the way it handles live memory. "Others take a more conservative approach, but that can be a problem if a program needs memory," he said.

Nilsen explained that the NewMonics JVM employs a memory defragmentation technique that delivers predictable response times of around 200 microseconds, while others that have been tested have displayed worst-case latencies of one second or more. Other new JVM features include control of garbage-collection priority, scheduling and collection rate, and method and class pruning, which the company said reduces its footprint by as much as 40 percent.

The PERC 3.1 IDE, which now includes the CodeWarrior interface from Metrowerks, is available now for Linux, Solaris and Windows hosts and is priced at \$3,000 per developer

► continued on page 16



NewMonics' PERC 3.1 IDE now includes the CodeWarrior interface.

DEVELOPER IQ TEST NO. 3

DEVELOPER NO. 1

QUESTION:

Which of these developers used Rogue Wave's DBTools.h++™ to develop a multi-database application?

Answer:
Developer # 1
of course!

DEVELOPER NO. 2



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GDPro 5 Supports Live Round-Trip Engineering, EJBs

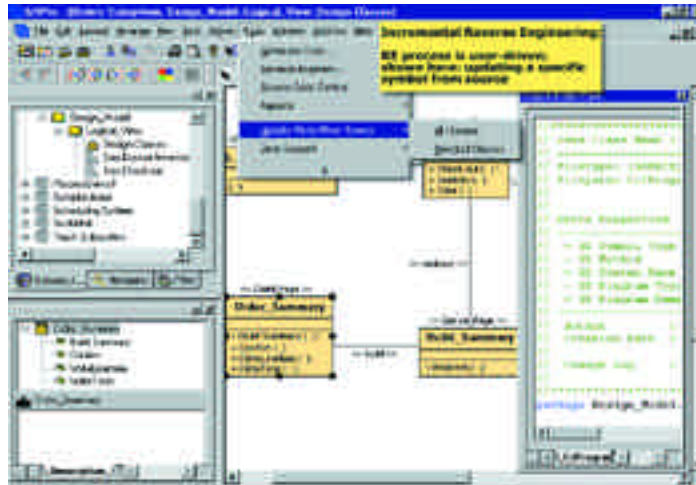
BY ALAN ZEICHICK

SANTA CLARA, CALIF. — Now, there's live round-trip engineering and EJB component modeling—that's the story from Advanced Software Technologies Inc. in regard to GDPro 5.0, the update to the company's visual UML modeling software announced at Java-Con. The top features of the new release are incremental live round-trip engineering and EJB support, said the company, as well as a new built-in JavaDoc editor and importation of Microsoft Visual C++ projects.

According to Joshua Horowitz, Advanced Software's director of marketing, GDPro's (www.gdpro.com) incremental reverse engineering keeps the

UML diagrams synchronized whenever source code changes are made, but allows developers or managers to control when new source is generated after the UML diagram. Horowitz said that this feature offers analysts and architects the option to control when Round Trip generates code, eliminating the overhead of having the tool generate code for "design artifacts," which are temporary UML structures that may never be needed at implementation. "GDPro is all about providing control and flexibility to the development team," he said.

When using GDPro to build Java applications, the tool can also now build Enterprise JavaBeans, said Horowitz, citing a



Developers can control when new source code is generated after the UML diagram as part of its round-trip engineering capability.

new "EJB Wizard," which walks developers through this complex process. The wizard, he said, helps developers convert UML class symbols to an EJB, load the appropriate Java classes, create Home and Remote interfaces, and populate the EJB with the necessary methods and attributes. After the code has been generated, GDPro helps developers use a built-in XML Deployment

Descriptor function to export and deploy the EJB onto an application server.

Another emphasis of the version 5 release, said Horowitz, was improving developers' ability to document the UML diagrams and source code. GDPro's new JavaDoc editor lets developers annotate individual symbols, classes or other systems, using either standard JavaDoc

tags or custom tags created as part of a company's programming standard, he said. Those tags are then incorporated into the automatically generated source code as comments—and the round-trip engineering features will push changes to the source-code comments back into the UML diagram, he said.

In addition, GDPro now includes the ability to import projects from Microsoft's Visual C++ 6, according to Advanced Software. GDPro can capture the associated files in the project and reverse engineer the entire system into UML diagrams.

Finally, GDPro 5.0 has completed its support of the UML specification by adding support for all three UML extension mechanisms, according to the company, with fully functional diagrams for stereotypes, tagged values and constraints.

GDPro is currently available for Solaris and Windows workstations, and can work with source code in the C++ and Java languages. Licenses start at \$2,995. ■

TIBCO VENTURES WITH NOKIA TO OFFER WIRELESS PLATFORM

BY DOUGLAS FINLAY

As a further sign that the wireless-commerce age is quickly descending upon the industry, Tibco Software Inc. announced a partnership last month to bundle Nokia's WAP Server with Tibco's ActivePortal 2.0 to create MobileConnect, which will deliver enterprise applications to mobile devices using the Wireless Application Protocol. The announcement follows on the heels of BEA Systems Inc.'s August announcement to port applications from its WebLogic Commerce Server to Nokia WAP Servers for delivery into mobile environments.

"The ActivePortal 2.0 product suite is the engine that will drive the MobileConnect product," said Marc Rolfe, wireless solutions manager at Tibco (www.tibco.com). He said the upgraded product suite, which develops highly personalized content for Web viewing, as well as delivers inventory, sales and customer service information to Web sites, already offers alerts and content delivery to wireless devices, but by bundling the WAP server the company's applications could now be "presented out to the full line of wireless devices" being served by WAP technology.

ActivePortal 2.0 is based on Tibco's Rendezvous real-time messaging software bus, a middleware layer that allows third-party applications to link to it,

and facilitate the flow of information. "With MobileConnect, we now have the ability to take internal applications such as billing and customer relationship management, plus external content, and enable mobile phones and handheld computers by offering these streamlined tools in an instant, real-time fashion," said Rolfe.

Rolfe said that MobileConnect would give programmers an opportunity to quickly develop and deploy applications into the field. "Developing new wireless applications for MobileConnect will be a real sweet spot for us," Rolfe continued.

He suggested that new forms factors would have to be considered for programmers when writing code to be used on mobile machines. "It will be a much different way of writing applications for mobile devices," he said, although he didn't elaborate on the shape the new forms factors would take.

New upgrades to ActivePortal 2.0, which houses MobileConnect, include multiple options for viewing Web and wireless content; an extensible service-based architecture for formatting content for delivery over wireless devices and Web pages; advanced searching capabilities; and unified access using the Rendezvous software bus to access other wireless protocols, such as Short Message Services (SMS). ■

Software AG Adds Tools to Tamino XML Server

New platform features include document conversion, distribution

BY DOUGLAS FINLAY

The Tamino native XML database server has finally found a platform.

Software AG (www.software-ag.com) has created a set of development products to enhance its Tamino XML server. The new Tamino XML Platform includes X-Studio, a tool for graphically developing XML documents; X-Node, a utility that adds connectivity and mapping to non-XML documents and applications; and X-Bridge, a central communications hub for dispersing XML content to other servers.

Chris Hearn, product marketing manager for X-Studio, said the new Tamino XML Platform was designed to help customers who have copious amounts of data, such as health-care providers and catalog publishing companies, manipulate the burgeoning influx of XML data, such as taking XML data and presenting it in a browser in HTML format.

Hearn said that X-Studio features an application wizard enabling developers to create a "read-write-update-delete Java application" simply by pointing

and clicking on an XML schema or Document Type Definition (DTD), and "presenting it to an HTML page in a browser."

Klaus Fittges, chief technology officer, claims that, "the [XML] schema often has business logic underlying it. Developers can expect embedded logic in correct schema description already"—enough logic to allow X-Studio to generate the new applications.

X-Node is a mapping program that allows developers to view XML data structures from within a Java framework. "The less experienced Java programmer can work at the Java field level rather than the low XML level," Hearn said, "adding that the mapping process was not simply a straightforward mapping XML hierarchy through to Java class structures, "but is also for building read/write methods on-the-fly to write back to the database." Servlet generators and debug compilers, as well as an API for X-Bridge, round out the developer offerings.

Once XML applications are created using X-Studio, the X-Node and X-Bridge components address integration of additional

database sources into XML at the Tamino server, and the transformation and routing of XML documents between applications. Hearn said the X-Node connectivity program connecting external non-XML sources such as relational databases to the XML database could create pure, single XML views of data stored in relational databases, and map the data into XML.

X-Bridge then acts as a central communications hub for enterprise-level XML-based information exchange by routing content to designated areas. Hearn suggested that, combined with the company's EntireX 5.3 middleware for transforming mainframe and midrange applications into *n*-tier applications, users could take CICS transactions, for example, see them in XML using X-Node, and then use X-Bridge to route them to other servers.

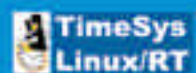
Available immediately for Windows NT/2000, Tamino Server version 2.2 is priced at \$25,000, plus \$2,000 for X-Studio per developer seat and \$12,000 for X-Bridge. The Solaris version of Tamino Server is \$40,000. ■



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BEA Ramps Up for E-Commerce

Customization is central to new Commerce, Personalization servers

BY DAVID RUBINSTEIN

Putting the theories behind the Java 2 Enterprise Edition (J2EE) specification to practical use, BEA Systems Inc. last month released upgrades to two of its servers that it claims will allow customers to quickly develop customized applications for e-commerce.

Commerce Server 3.1 and Personalization Server 3.1 mark the third major release of the products that first hit the market in January, according to Mark Carges, vice president of engineering and product management for the e-commerce application division at BEA. "Our customers wanted J2EE-based software to go with the WebLogic Server," Carges said.

The key features of the new releases revolve around personalization, both of the presentation of the Web site based on a customer profile and of the business logic required to complete a transaction. The new releases will be available with limited-use licenses for content-management software from either Documentum Inc. or Interwoven Inc., Carges said, as well as with analytics tools from Broadbase Software Inc. The content-man-

agement software allows for gathering customer information at run time in a unified user profile, as the user goes through the Web site, and the analytics tool provides offline analysis of that information, completing a closed-loop feedback mechanism, Carges explained.

Personalization Server 3.1 will offer new WebFlow architecture that, according to Carges, can create a site scheme based on prior user experiences. "Each user will see a different set of pages" based on past use. The Commerce Server 3.1, through pipeline components, provides customization by using session beans to call out various parts of the business logic from the time a user hits the site, browses a catalog, fills a shopping cart and receives confirmation of the transaction. A repeat customer, for instance, might be able to skip certain steps in the transaction process, while a first-time customer will need to take each step as his profile is established, Carges said. Each product also comes with pre-configured WebFlow and pipeline schemes to provide a prototype for an e-commerce site, including built-in tem-

plates with Java Server Pages tags calling into tag libraries for functions that are reused—such as user registration and order management—or combined with custom text and graphics.

"We see this as a natural extension of J2EE," Carges

said, "by providing a platform for e-business. We look at the WebLogic Server [upon which the releases are built] as our operating system."

Commerce Server 3.1, which includes Personalization Server 3.1 and a clustered version of

WebLogic Server, is available for \$45,000 per CPU. Personalization Server 3.1, with a clustered version of WebLogic Server, sells for \$30,000 per CPU. Each can be downloaded with a limited-use license at www.bea.com. A limited-license version of Documentum 4i Web Content Management Edition also is available at the BEA site, and Interwoven's Content Express will be available in December. ■

WebLogic 6.0 in Beta With Upgrades for E-Commerce

BY DAVID RUBINSTEIN

BEA Systems Inc. is heralding the beta release of the WebLogic 6.0 application server as the most significant release of the product in several years, with improvements in three important areas to help facilitate the management of e-commerce, according to product manager John Kiger.

The first upgrade is the inclusion of a Web-based management console based on the Java Management Extension (JMX) included in Sun's Java 2 Enterprise Edition specification. Kiger said the console simplifies the management of the WebLogic server and applications by replacing the com-

mand-line method required in the past to manage an individual or multiple servers.

The second improvement is a new implementation of the Java Messaging Service (JMS) that now supports clustering for scalable, message-based applications. Managers can cluster multiple JMS servers together to handle heavier loads, he said. "Clustering is unique to the architecture but transparent to the JMS application," Kiger said.

The final piece is a new distributed transaction manager, which Kiger explained coordinates transactions among multiple systems and resources. "This is very complex, and very few app servers even attempt it," he

said, adding that IBM, with CICS, was the leader for main-frame transactions and Tuxedo was the leader for open and Unix systems. BEA used the engineering team that built the Tuxedo transaction server to build the transaction manager for the new release, he said. The key feature is the ability to roll back a transaction to its prior state if any entity fails during the transaction process, Kiger said.

"We're trying to make it simpler to manage e-commerce within the context of a Web application server," Kiger said. "We're opening up the e-commerce space to more tightly integrate apps whether over a firewall or within your enterprise in a highly scalable way."

WebLogic 6.0 beta is available for download now at www.bea.com, and is expected to be in general release by the end of the year. ■

Understanding Changes in Dollars and Sense

Projeca InChange allows managers to assess impact of change requests

BY DAVID RUBINSTEIN

A tool to integrate change management with time sheets, work flow and expenses is at the core of Projeca E-Workforce Suite v6, due out later this month from Tenrox Corp.

The tool, Projeca InChange, is designed to allow managers to evaluate the change and then calculate the impact on man-hours, deadlines and costs before deciding to implement the change and assigning the work to a team member, according to Ludwig Melik, Projeca product manager at Tenrox (www.tenrox.com). InChange is just one of 11 components included in Projeca Suite, which also has tools for such functions as tracking time sheets, expenses, cost and revenue, invoices and billing and a hierarchical

view of the organization. Now, with InChange, issue tracking, help desk and bug tracking are integrated into the management suite.

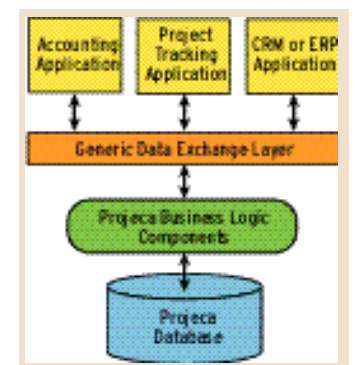
According to Melik, Projeca E-Workforce Suite was designed to be used in conjunction with project-management

tools such as Microsoft's Project and Primavera's TeamPlay, and messaging applications. The suite has functionality to allow for planning, procedures, cost control, performance reporting and resource and risk management. "We don't want to do Project or Crystal Reports,"

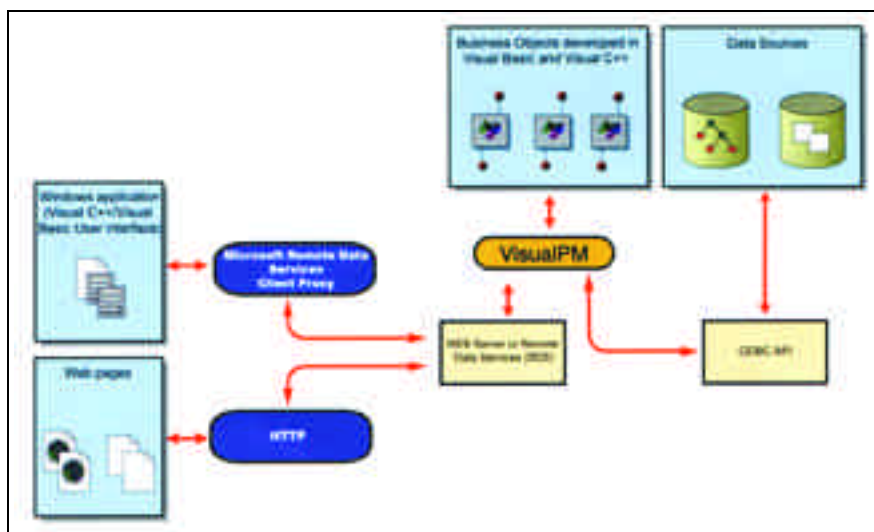
Melik said. "We provide integration but don't redo what those tools do so well."

The new release also will have the capability to track projects based on the phase they are in, such as research, development or maintenance; and site scooping to limit access of remote users to a central database or project code.

Another important feature of the upgrade suite is VisualPM, a free SDK that allows Visual Basic programmers to extend or customize the suite, or integrate it with third-party tools. Through an OLE interface with Microsoft Project, data can be synchronized across a variety of enterprise systems. A Windows NT/2000 server is required to run the application, and users access the suite's applications through a Windows application, a Web-based interface or e-mail. "The advantage of accessing through e-



The Projeca database stores project phase info for calculating impacts of change.



The VisualPM component permits VB developers to customize the Projeca Suite.

mail is that [an enterprise] won't have to buy 300 or 400 database licenses from Oracle," Melik said. The new release adds DB2 support in addition to existing support for Microsoft SQL Server and Database Engine, and Oracle. "All you need is a browser," he added.

Projeca E-Workforce Suite, set to be introduced in mid-November, will sell for \$380 per user. Projeca InChange, the change-management software, will be available for \$180 per user as a stand-alone application. ■

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IBM claims its new zSeries mainframes are designed to replace the gigantic server farms of Sun and Hewlett-Packard.

IBM Unveils zSeries Internet Servers

Next-generation S/390 mainframes to run new 64-bit z/OS

BY EDWARD J. CORREIA

Mainframes are making a comeback.

IBM Corp. continues to target Hewlett-Packard and Sun for the high end of the Internet server arena, this time with the zSeries, a line of newly designed mainframe computers built around the company's new 64-bit processor and operating system. IBM will continue to market and sell its S/390 systems and software, but will halt development on new versions.

At the core of the newly designed servers will be the IBM multi-chip module, which reportedly combines 35 chips on 101 layers of ceramic onto a 5-inch square module, one-quarter-inch thick. Like the S/390, the new zSeries hardware will be able to separate the operating system into hundreds or thousands of logical partitions or virtual servers, each able to run different operating systems and/or applications simultaneously.

But unlike its predecessor, the 64-bit z/OS will include the Intelligent Resource Director (IRD), which, according to Pete McCaffrey, IBM's program manager for enterprise servers,

makes continuous adjustments in the power and capacity delivered to each virtual server based on business priorities assigned by a system administrator. "In a classic e-business environment, you don't know when peaks are going to occur," he said, "but when they do occur, they can be 10 times or even 100 times the norm."

To accommodate these peaks, McCaffrey said the IRD will automatically detect changes in workload requirements and respond by delivering the extra capacity to handle the peak without impacting response times and service-level objectives. No changes to applications are required. "This

is an element within the operating-system architecture, and totally transparent to the application developer."

IBM also is changing its pricing policies. In a radically new approach, IBM will charge customers according to need rather than by system capacity. This strategy, McCaffrey said, gives small companies the opportunity to deploy the kind of power that before was within reach of only the most well-capitalized companies.

In the new pricing model,

z/OS customers configuring a server with 200 virtual servers, for example, would pay for just 200, even though their server might be capable of servicing 1,000. Under the old model, the same customer would be charged for 1,000. The difference is a new License Manager component, which monitors virtual server usage and permits administrators to cap maximum usage to conserve costs. As long as the average number of virtual servers does not exceed the number of licensed copies in any four-hour period, the customer incurs no additional charges. McCaffrey said the technology was developed partly to address the needs of ASPs and ISPs, which experience huge peaks and valleys in usage.

The new zSeries hardware, which is scheduled to begin shipping on Dec. 18, will run all of IBM's current S/390 operating systems, including OS/390, and their applications, McCaffrey said. The company also offers a set of extensions for Linux versions from Red Hat, SuSE and TurboLinux. IBM is working on a 64-bit version of Linux for the new hardware. The zSeries hardware pricing starts at around \$750,000. ■



zSeries handles the peaks and valleys of Internet commerce, says IBM's McCaffrey.

News Briefs

COMPANIES

Percussion Software Inc. and **arcadiaOne Inc.** have announced a joint marketing agreement in which arcadiaOne's XML-based syndication technology will combine with Percussion's XML content management system. Percussion's Rhythmyx Content Manager will aggregate and manipulate information from content partners—managing the content through the approval process, and then hand the content off to arcadiaOne's eSyndication engine for syndication through electronic channels. Both companies see the agreement as enabling their customer bases to automate the creation, management and exchange of content over business-to-business networks . . .

DataMirror Corp. has acquired the assets of **Constellar Corp.** As an early pioneer in the EAI marketplace, Constellar's acquisition is seen by DataMirror as a way to strengthen its presence in the global Oracle market

because Constellar's integrated packages are based on Oracle platforms . . . **IBM Corp.** has released a new redbook (a technical reference manual) titled *C and C++ Application Development*. The book, distributed free in Adobe PDF format, covers problems programmers face when migrating applications to AIX, and includes shared libraries, C++ templates, shared memory, compiler products and options, and measuring and improving application performance. The redbook can be downloaded at www.redbooks.ibm.com . . . **Reliable Software Technologies** has changed its name to **Cigital Inc.** Jeffrey Payne, Cigital's president and CEO, said the name change is designed to more accurately define the singular focus on software risk management, while soundly conveying a technological strength.

Its flagship product is Cigital Advantage, consisting of proprietary technologies that expose and manage software-induced business risks

. . . **Datasynapse Inc.** has selected **Progress Software Corp.'s** Progress SonicMQ E-Business Messaging server to embed into the Datasynapse processing network. The Datasynapse distributed peer-to-peer platform focuses on the financial services sector, targeting enterprisewide risk management, scenario simulations and other parallel computer-intensive applications. The scalable SonicMQ message server is seen as speeding and securing timely delivery of business-critical information from the platform across the Internet.

PRODUCTS

Dundas Software has released the **Dundas Chart ActiveX Client Edition**, an OpenGL-powered charting component for the client side. For use in Visual Basic and Visual C++ environments, the chart for ActiveX employs object-oriented architecture and COM, and provides for tex-



ture coloring blending, a template editor, edge beveling and annotation. The ActiveX Client Edition sells for \$299 . . . **Tibco Software Inc.'s** new **Tibco ActiveExchange 2.0** for connecting business trading partners features four products that constitute its new modular-design suite: TIB/BusinessConnect 2.0, which supports several online exchange standards, such as cXML, ebXML and BizTalk; TIB/BusinessConnect for RosettaNet 2.0, which supports the RosettaNet Implementation Framework (RNIF); TIB/BusinessPartner 2.0, an updated business-to-business server for medium-sized trading partners; and TIB/PartnerExpress, a new customizable, scalable browser-based application that quickly integrates thousands of small/low-volume trading partners in an e-marketplace or a company trading network. Pricing for ActiveExchange 2.0 starts at \$100,000

. . . **Citrix Systems Inc.** will offer its **MetaFrame Extended Platform** software next year. New capabilities of the modular deployment system will include better deployment, manage- ▶ continued on page 30

Taviz Embraces XML, XSLT

eIntegration Suite also adds new Java SDK, object modeling APIs

BY DAVID RUBINSTEIN

Armed with \$7.5 million in funds raised in August, Taviz Technology Inc. has released an upgrade to its eIntegration Suite, which helps companies

with process and data modeling and data integration, with new features that Taviz said will allow customers to preserve existing infrastructure and integrate applications more quickly

without extensive coding.

Taviz (www.taviz.com), which was called SmartDB until April, has been selling individual tools to help enterprises with data integration, but through part-

nering with such companies as IBM, PeopleSoft and Oracle, as well as the RosettaNet consortium, has been able to gain the components necessary to address the needs of customers whose operations are message-centric as well as based on a Web architecture.

Among the new features in

eIntegration Suite 2.0 are an XSLT-driven template editor that allows users to translate any XML format; an HTML connector that reads content, transforms it to XML and delivers it to any of the suite's supported formats; a Java-based management console that provides improved monitoring of integration processes; and an object-model API and Java SDK to ease integration of third-party software, building applications and developing custom connectors, according to product manager Gavin Harvett.

"This doesn't take away the need for programmers," Harvett said. "It makes them more productive by providing a standardized methodology to define integration within their organizations."

The template editor, he explained, provides both a text view and a hierarchical tree view of data during XML transformation so users can "drag and drop" from the source code into the tree and automatically create a mapping pattern. Transformation rules can be edited and tested during this process, he added. The output from the template can be mapped to multiple targets, "making it more reusable," he said. The load input is then forwarded into the company's Integration Server either at a specified time or as triggered by an event, he added.

The components of eIntegration Suite are Integration Console, for management of the integration process; Integration Studio, which includes the templates; Integration Process Modeler, which allows for grouping of these components for modeling the flow of business objects through the enterprise; Integration Server, which routes and delivers the templates; Integration Engine, for batch extraction, transformation and validation; and SDKs, for Java and C++, for rapid development of applications for Integration Server. Supported operating systems are AIX, HP-UX, Solaris, Tru64 Unix and Windows NT/2000.

Integration Suite includes native support for Oracle and SQL Server databases, and connectivity to any ODBC-compliant database. The company claims to have the most complete set of adapters for Oracle 11i applications, according to Suzette Cavanaugh, vice president of marketing, as well as adapters for a number of ERP packages. ■

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PLATFORM PRODUCT OVERVIEW

- database management;
- application and data integration;
- application development.

For integration, the platform employs Tamino X-Bridge, for the transformation and routing of XML documents between applications, and Tamino X-Node for the integration of traditional data sources (e.g. SQL databases) into the XML World. As one of the platform's development components, Tamino X-Studio provides a complete tool-set for conveniently creating and managing XML documents and Java-based electronic business applications.

STORING NATIVE XML

The XML Platform for Electronic Business

Tamino

DOM APIs, Servlets, SDK

Data Base Management **Tamino**

Data Integration **Tamino**

Other Data Sources

Other XML Sources

XML

Development Tools **Tamino**

Java Development **Bojaro**

XML Messaging **Tamino**

Web Server

Applications

Development

Server

Integration

and reliable search and retrieval. The ability to cope with high access loads in mission-critical applications and to deliver information in any target format for any output device are also features that set Tamino XML Database apart. In addition, Tamino provides server extensions for accessing remote applications or programming custom server-side functionality such as event-triggered data processing or predefined complex queries in Java or C++.

Tamino XML Database scales from Windows NT / Windows 2000 platforms through Unix and soon to Mainframe-based operation.

INTEGRATING DATA

Enterprises extending their business to the Internet typically must integrate existing back-end data stored in hierarchical, relational and object databases. The Platform's X-Node component provides users with a single server view of business data residing in both the XML Database and the above-mentioned external data containers. Reading (or writing) data through Tamino X-Node includes real-time conversion of externally stored data into (or from) XML data streams.

INTEGRATING APPLICATIONS

Exchanging XML documents with customers, suppliers and business partners over the Internet is key in the networked economy. Tamino X-Bridge provides a central communication hub for enterprise-level XML-based B2B information exchange. According to user-defined rules, the content and structure of XML documents are analyzed and routed to the appropriate receiver at low cost and without human intervention. Content-based routing rules use the values of specific XML elements and attributes, whereas source-based routing uses either the sender's TCP/IP network address or digital certificate information. Transformation of the original XML message is sometimes necessary to ensure that the data is delivered in a format that the receiving application understands. Tamino X-Bridge uses standard XML document transformation based on the XSLT standard.

DEVELOPING XML APPLICATIONS

The Tamino XML Platform is supported by a number of application development tools that are specifically geared to the requirements of

programmers creating XML-centered applications. The tools, some provided by Software AG and some by partners, are tailored to the different roles and skills of electronic business application developers. The Software Developer's Kit (SDK) provides all necessary functions to develop application-specific interfaces for access to Tamino in C, C++ or Java (e.g. basic SAX and DOM APIs in Java, JScript, Perl or ActiveX).

Tamino X-Studio is available for Windows NT and Windows 2000 Professional and allows for rapid development of scalable XML-based applications and for building XML-related documents or XSL style-sheets (e.g. for X-Bridge transformations). It includes an easy-to-use application-generation wizard as well as an integrated set of complementary standard XML tools from technology partners. These are XML editors and schema editors (XMetaL, XML Authority, XML Instance, XML Console), a stylesheet editor (Stylus), and an XML-to-language data-binding tool (Breeze XML Studio). The latter allows object-oriented programmers to access XML data stored in the XML database without knowledge of XML structures or rules.

Bolero is a Java-based development environment for building professional, mission-critical J2EE-conformant applications. Bolero gives applications direct access to heterogeneous IT systems, such as relational databases, ERP systems and diverse component models. It perfectly integrates with Tamino XML Database and supports entire development teams that need to access a common database (team repository) holding all available Bolero objects.

STANDARDS-CONFORMANT

Communication to/from Tamino XML Database or Tamino X-Bridge is based on Internet standards such as HTTP and TCP/IP. Administration or user access to the XML database is possible using standard Java-enabled Web browsers.

While Tamino products for various development or integration purposes follow their respective standard recommendations, such as XSLT, XPath or DOM (level 1), ODBC, JDBC or DCOM, all Tamino XML Platform products are compatible with the W3C recommendation, XML 1.0 and conform to the Unicode standard for internationalization. Furthermore, Bolero is J2EE-conformant, supports the Java servlet standard and multiple component models such as EJB, CORBA and DCOM. As standard recommendations change or new ones become available, Tamino XML Platform products will be adapted accordingly.

FREE STARTER KIT

The XML Starter Kit is free of charge and integrates all products necessary to start implementing XML solutions quickly. All components described above (and more) are available as time-limited evaluation versions. Just register at the Software AG corporate website for your personal copy.

<http://www.softwareag.com/xml-starterkit>

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RTOS Developers Take Sides

Software, driver tool vendors form alliances, hoping to back the right horse

BY EDWARD J. CORREIA

SAN JOSE, CALIF. — "In the end, there will be three embedded superpowers: POSIX, Wind River and Win32."

So said Robert Nislick, spokesman for VentureCom Inc., the company that invented Windows NT Embedded. Nislick said that VentureCom's recent acquisition of embedded tools pioneer Phar Lap Inc. in September was meant to solidify the company's dominance in the Win32 development tools market.

According to Roy Kok, vice president of marketing at VentureCom (www.venturecom.com), the Phar Lap acquisition also gave VentureCom something that Microsoft could not—an x86-compatible RTOS based on the Win32 APIs, with emphasis on the "real time." "Microsoft operating systems are as capable as any other, but there's a market that Microsoft can't address. So we bought Phar Lap, and that lets us compete with Wind River and others," he said. "Now we can play in the kilobyte space," Nislick added.

Meanwhile, other embedded developers are strengthening their alliances with Microsoft and Wind River, and several were announced at the recent Embedded Systems Conference here.

EMBED WITH MICROSOFT

Software services and integration company **Annasoft Systems** (www.annasoft.com) has introduced two new tools for OEMs developing drivers for Microsoft embedded systems. Jump Start NTE is a toolkit for generating Component Definition Files by comparing a Windows NT Embedded image before and after the installation of a driver or application. Jump Start 3.0 Platform Library Kit is a board support package that includes preconfigured generic build trees for x86 hardware and enhanced drivers and components for Windows CE, adding to the Microsoft Platform Builder 3.0. The kit reportedly enables OEMs to quickly build Windows CE images using off-

the-shelf x86 hardware targets.

Windows tools developer **BSquare Corp.** (www.bsquare.com) introduced a bevy of new and upgraded tools for Windows platforms, including SmartBuild Product Design Packages, a series of prepackaged device foundations. The company claims that OEMs using Smart-

Build are able to design and begin manufacturing devices based on Microsoft embedded systems, such as data terminals and collection tablets, Pocket PCs and cordless Internet appliances, in weeks rather than months.

BSquare also released a version of its Time Critical Extension (TCX) for Windows NT 4.0 and Windows NT Embed-

ded off-the-shelf applications for Windows CE, including instant messaging, e-mail, faxing, data backup and benchmarking.

Embedded development tools maker **CAD-UL** (www.cadul.com) demonstrated its CAD-UL C Compiler for the Motorola Coldfire processor, a 32-bit, variable-length RISC processor designed for low-cost embedded systems. The company also announced support for the Hitachi SuperH SH-3 RISC processor and Intel's XScale microarchitecture for low-power wireless applications. With support of the Hitachi processor, the company's XDB ROM Monitor will bring operating-system-level awareness and kernel-level debugging inside Windows CE prior to and during the pre-Windows CE start-up phase, the company said. CAD-UL is

company (www.windriver.com) was scheduled to release XScale processor-based hardware reference designs shortly thereafter, following with a firmware development kit before year's end.

Wind River also released Tornado for Intelligent I/O 2.0, an integrated development environment for input/output processors. The new version features support for TCP/IP, and is enhanced to address the needs of developers targeting IP storage, network-attached storage, storage area networks and Web accelerators, the company said. The suite reportedly supports major Intel I/O processors, the StrongARM SA110 and future processors based on XScale.

Embedded design automation tools company **Aisys Inc.** (www.aisysinc.com) announced that its DriveWay driver automation tools will now support the MIPS Technologies' MIPS32 processor architecture, adding to a list that also includes Motorola, National Semiconductor and Texas Instruments microprocessors and microcontrollers. Its flagship product, DriveWay, automatically generates device drivers, boot code and "glue" necessary for applications to communicate with Wind River's VxWorks and pSOS, or Express Logic Inc.'s ThreadX operating systems, the company said.

According to Nancy Chou, Aisys' vice president of marketing, DriveWay's bottom-up approach allows developers to "concentrate on application development and leave the rest to us." Aisys also offers

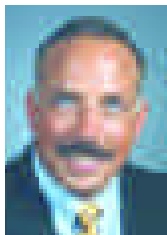
DriveWay Lite, a free version for 8-bit processors. Both products are royalty-free.

Development tools company **Applied Microsystems Corp.** is working on a version of its CodeTest software verification tool for VxWorks AE, the advanced edition of Wind River's RTOS designed for high-availability applications.

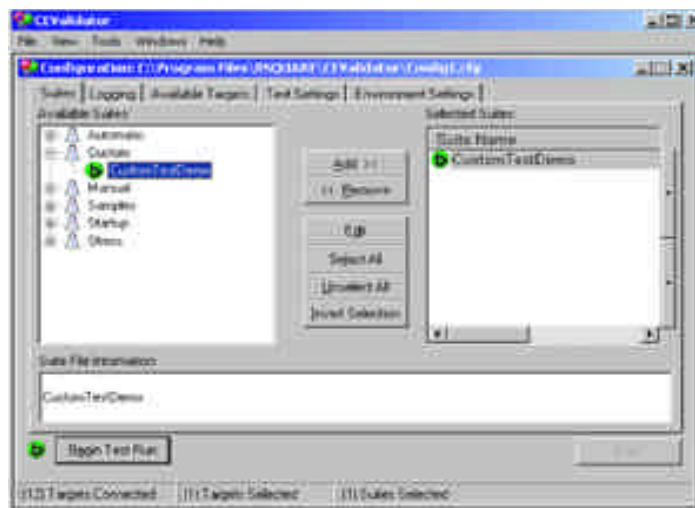
CodeTest is part of CodeOptix, a family of high-level tools from Applied that present application activities graphically to aid in the debugging process. The tool, which includes an in-circuit memory allocation analysis component, provides verification of software performance and code coverage. Applied (www.amc.com) is scheduled to release CodeTest for VxWorks AE before the end of the year to coincide with Wind River's release of its new RTOS.

Java developer **Nazomi Communications Inc.** demonstrated JStar, a Java accelerator for VxWorks that the company claims requires no system memory to operate. According to Nazomi (www.nazomi.com), JStar is technically considered a coprocessor and acts like a just-in-time compiler in silicon. However, unlike conventional JITs, which require memory to store compiled code, JStar executes the code directly in silicon, thereby gaining its speed.

JStar is provided as intellectual property for RISC or CISC processors, and requires no changes to the native processor core, the company said. Nazomi, named after Japan's bullet-fast express train, changed its name recently from JEDI Technologies Inc., which stood for Java-enabled devices for the Internet, and had nothing to do with characters from the "Star Wars" films. ■



Phar Lap gave us something that Microsoft could not, says VentureCom's Kok.



BSquare's CEValidator assists developers with porting code to Windows CE.

ded 4.0. Formerly, the software was available only for Windows CE. According to the company, the extension adds real-time performance to the Microsoft operating systems, including low-latency interrupts and timers, and a flexible timer priority scheme, without the need to change existing device drivers. TCX is offered as an extension of BSquare's WinDK and WinRT driver development kits, the latter of which now includes USB development capabilities.

Other new or upgraded BSquare products include the bInTouch Developers Kit 1.1 for building voice-over-IP applications for Windows CE-based devices, CEValidator PassPoint 1.1, PassPort 1.3 and PassCode 1.2 code testing and validation tools, and a series of

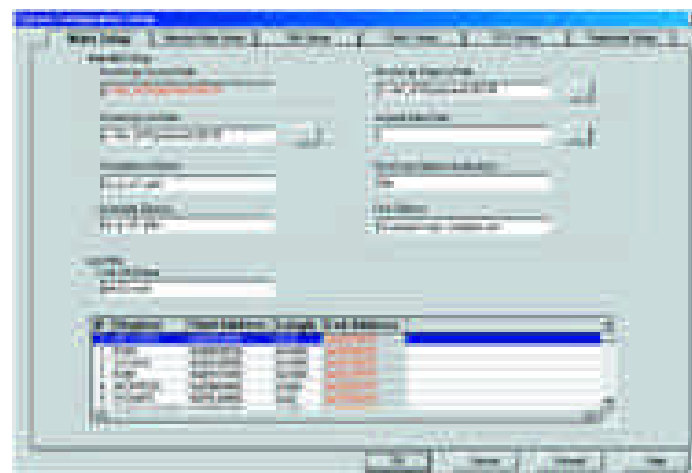
scheduled to release the debugger, as well as an optimized C/C++ compiler for XScale before year's end, with additional XScale tools to be released later.

WIND RIVER FLOOD

Also embracing Intel's new XScale microarchitecture is **Wind River Systems Inc.** The company is developing what it claims will be the first hardware-assisted debugging tools suite for the I/O-enhanced technology from Intel, and is the result of Wind River's contribution to the development of an on-chip XScale debugging interface for Intel, Wind River said. The tools, which are designed to permit OEMs to make use of debugging tools during and after hardware development, were scheduled for release in mid-October. The



DriveWay lets developers focus on programming, says Aisys' Chou.



DriveWay features a point-and-click interface to generate device drivers, boot code and glue for VxWorks, pSOS and ThreadX.

Hardware Abounds at Embedded Conference

Reference designs, chip support showcased at industry's largest show

BY EDWARD J. CORREIA

SAN JOSE, CALIF. — The San Jose Convention Center was brimming with exhibits at this year's Embedded Systems Conference, many of which were showcasing new hardware. From Web-aware processors to fully integrated servers, embedded developers have more ways than ever to deploy their applications.

Starting at the back of the alphabet, embedded industry veteran **Zilog Inc.** was demonstrating its new eZ80 Webserver, a silicon-and-software package that combines an 8-bit, 50MHz microprocessor with embedded Web software featuring 15 Internet protocols, including HTTP, TCP/IP, DHCP, SMTP and PPP.

The eZ80, which loads software from external memory, can address as much as 16MB of memory without an MMU (memory management unit), the company said. The unit is designed to take the place of a dedicated embedded computer, permitting the host device to be remotely managed, configured and controlled through a Web browser. The



Zilog's eZ80 does an embedded PC's work at a fraction of the cost.

eZ80 Webserver is priced at \$8.15 each for 10,000 units and is scheduled to be available in production quantities in January 2001. Zilog also provides software development tools. The IETF- and W3C-compliant Webserver software suite is scheduled to be available for download this month at www.zilog.com.

For embedded applications needing a bit more horsepower, **Force Computers**, a subsidiary of **Solelectron Corp.**, has announced a dual-Pentium III board support package for Wind River's soon-to-be-released VxWorks AE. The package will enable the Force PowerCore CPCI-680 single board computer (SBC) to take advantage of AE's new high-availability features. Force

(www.forcecomputers.com) also announced the Flexor IDP3S370, an SBC designed for single or dual Intel Pentium III processors and the ServerSet III LE chip set from embedded chip maker ServerWorks Inc.

Taking OEMs a step closer to releasing finished goods is embedded software developer **Computer I/O Corp.** (www.computerio.com), which introduced its DirectServer Series of configurable, rack-mountable network data servers. Based on a proprietary Linux kernel, the systems are integrated with the company's Easy I/O programming interface, permitting developers using a browser to build custom digital and analog I/O applications for data acquisition or telecommunications.

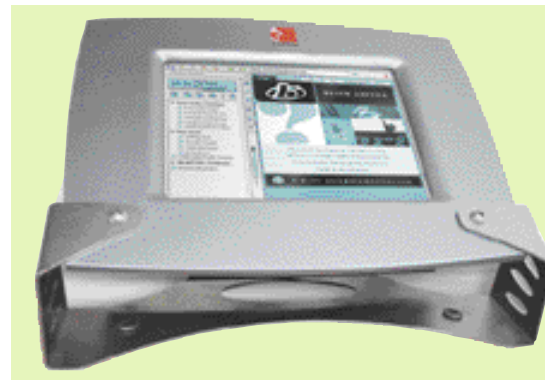
General Software Inc. (www.gensw.com) announced Firmbase, an operating environment that enables applications to execute at the system firmware layer and continue running after the operating system crashes or becomes unavailable. According to the company, the OEM- and ISV-targeted Firmbase is designed for creating mission-critical applications such as administration and monitoring, security and audit trails, and real-time tasks that work together with the foreground operating system. Applications are created using standard 32-bit Windows development tools for Portable Executables, the company said. The system relies on Embedded BIOS 2000, a new version of General Software's preboot and BIOS firmware for x86 embedded systems.

On the heels of the divisive news that it had released a prototype of its hard real-time Linux kernel, open-source developer **MontaVista Software Inc.** (www.mvista.com) has made available a port of its Hard Hat Linux operating system for NEC VR4181, VR4121, VR5000 and VR5432 64-bit MIPS RISC processors and evaluation boards, which can be used for developing a diverse array of devices from battery-operated handheld computers to high-end imaging systems, the company said. MontaVista also will offer sup-

port subscriptions for OEMs using the boards.

Embedded Java developer **Espial Group Inc.** was demonstrating TotalIA, an Internet appliance reference platform that combines the company's Java applications and DeviceTop operating environment with an embedded Linux kernel from Red Hat. DeviceTop is a service delivery and device management technology that permits OEMs and ISPs to offer customers new and upgraded applications and services and to download system upgrades and patches after deployment.

Jaison Dolvane, Espial's president and CEO (www.espial.com), said that although his company's Java software was "platform agnostic," TotalIA was designed to do more than simply prove the concept. "Internet access is becoming a



Espial's Internet appliance reference platform embeds Red Hat Linux and its own Java-based GUI and delivery platform.

commodity. ISPs want to make money from services, and we provide that. But we sought to integrate with other OS vendors for time-to-market reasons."

TotalIA is built around a National Semiconductor Media GX/x86 processor board with touch-screen support and a multitude of I/O interfaces, and will integrate a JVM from

Tao Group, Macromedia Flash and the company's own browser, e-mail and personal information manager applications in a footprint of less than

14MB, the company said. TotalIA was set to begin shipping in October.

With an eye toward the future, embedded development tools maker **Tasking Inc.** has announced that it will support the forthcoming StarCore SC100 DSP core technology with the SC100 Tool Suite. A result of a joint venture between Lucent Technologies and Motorola, the StarCore SC140 and SC110 DSP cores are currently in beta.

According to Brian Mulcahey, Tasking's vice president of worldwide corporate marketing (www.tasking.com), when the C/C++ IDE is released some time in the first half of next year, it will be the only tool suite available for the new processor cores. "We pretty much own the market on this chip," he said. Mulcahey characterized the StarCore as an important migration platform for current customers of Motorola's 56K processor cores, and said that chip migration tools will be built into the suite along with a debugger for processors with or without integrated DSPs. ■

HP Ports Chai Clean-Room JVM to Linux

Java-compatible virtual machine is now cross-platform

When Hewlett-Packard Co. introduced its Java-compatible environment, called the Chai Appliance Platform, in 1998, the embedded virtual machine's reference platform was Microsoft's Windows CE. HP has now demonstrated that the Chai can be a cross-platform solution with the release of a Linux version of the ChaiVM virtual machine.

The latest Chai Appliance Platform, version 5, consists of a number of interlocked service layers, running between the embedded operating system and the application. The key component is the ChaiVM, which runs directly on the RTOS. The virtual machine includes TurboChai, a just-in-time compiler, and ChaiFreezeDry, an optimizing class loader that compresses Java applications prior to execution.

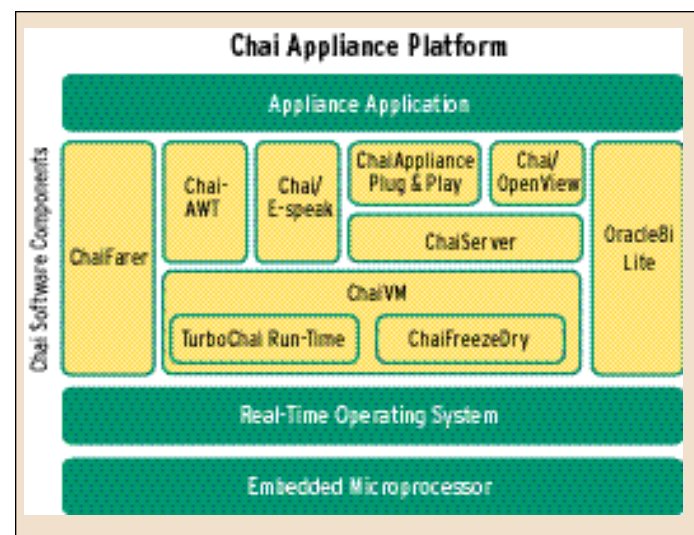
A number of other service layers provide additional functionality to Java applications, such as ChaiAWT, which pro-

vides graphics support, and Chai/OpenView, which links embedded devices to HP's OpenView management software.

New with version 5 of the Chai Appliance Platform (www.hp.com/chai) is an update to ChaiServer, HP's Web-based application server. The new ChaiServer 3.0 offers

secure communications with SSL (Secure Sockets Layer) and e-mail capabilities using SMTP (Simple Mail Transport Protocol).

The update of Chai Appliance Platform 5 also supports non-HP development tools, such as Inprise's JBuilder and Oracle's JDeveloper. ■



The ChaiFreezeDry component compresses Java apps before execution.



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JAVA

◀ continued from page 1

seat plus volume-dependent royalties. Target operating systems include Linux, OSE, pSOS, RTX, VxWorks and Windows CE, running on x86, Pentium, 68K, ARM, PowerPC and MIPS target processors.

In response to NewMonics' claims of the most efficient garbage collection, David J. Hoff, president and general manager of Java developer **Esmertec Inc.**, NewMonics' chief competitor, said that the issue of real-time Java performance is a broader one. "What sense does it make to look just at garbage collection? My neighborhood has a good one, too, but the streets are not always clean."

The Zurich, Switzerland-based Esmertec (www.esmertec.com) demonstrated Jbed Micro Edition CLDC, the newest version of its flagship small-footprint RTOS JVM written in 100% Pure Java, which it characterizes as a drop-in replacement for Sun's J2ME CLDC JVM. Jbed runs directly on hardware, and because Java code is compiled, and never

interpreted, Esmertec claims a performance improvement of as much as 20 times over that of the Sun JVM. The Jbed Micro Edition CLDC was scheduled for release in October for Palm OS, and for 68K-, PowerPC- and ARM-based devices.

Also endeavoring to build a better mousetrap is **Emwerks Inc.** The embedded developer demonstrated the Kada VM, its clean-room small-footprint JVM for Palm OS 3.5 and Windows CE 2.11 and 3.0 that executes Personal Java applications with as much as 6MB of Java heap and stack space, eliminating the memory limitations of Palm devices, the company said. The Kada VM also is compatible with Windows NT and VentureCom RTX running on x86 hardware.

According to Emwerks (www.emwerks.com), Kada in its base configuration occupies 130KB of memory and is unlike so-called "micro-Java" platforms because of its compatibility with object streaming, a feature that permits handheld devices to stream data to and from remote databases, and because it supports

the Abstract Windows Toolkit (AWT), an API that enables developers to use GUI components in their Personal Java applications. With AWT, Kada requires a 155KB footprint, the company said.

For \$289, developers receive the Kada API for use with their own IDE, plus VMs for the target platform and for Win32; the latter enables debugging and optimization on a Windows NT host prior to deployment. Run-time pricing is volume-dependent and individually negotiated.

How deep is "deeply embedded"? **Digital Communication Technologies Ltd.** (www.dctl.com) answers the question with Lightfoot, a 32-bit micro-processor core for embedded Java. The company claims the processor core delivers five times the code density of its competitors. The U.K.-based company announced here that it would begin licensing its core technology to consumer electronics and embedded device manufacturers under a silicon intellectual property program.

According to Chris Turner, DCT's chief technology officer,

putting Java in the silicon delivers about 10 times the performance of a software interpreter. Turner said that such performance is critical to DCT's target customers, which are micro-processor and smart-card makers, because it gives them the ability to deploy Java applications to a speedy execution environment. Pricing on the development system is device- and market-dependent, and starts at \$3,000. The kit includes the Lightfoot development card and an ANSI C-compliant IDE, or developers can use their own. Ports of the run-time components are available for J2ME, JavaCard, KVM and JINI.

IBM Corp. demonstrated VisualAge Micro Edition 1.2, the latest version of its Java IDE that now features support for AWT, Remote Method Invocation (Sun's Java object communications protocol) and OSGi bundle management, which enables software updates to be sent to remote devices after deployment.

The new version also features support for Windows 2000 hosts, and new run-time components for PowerPC, StrongARM

SuperH, x86, MIPS and 68K target processors, as well as Hard Hat Linux, iTRON Palm OS, QNX Neutrino, Windows CE and embedded RTOSes. IBM claims it is still the only one to provide application run-time components for multiple targets from a single code base. VisualAge Micro Edition 1.2 is free and can be downloaded now at www.ibm.com/software/ad/embedded.

FROM THE VALLEY TO THE CITY

Attendees of CMP's Embedded Systems Conference next fall will not need to know the way to San Jose; the show has outgrown the city and will return to San Francisco from whence it came.

About 375 exhibitors crammed into the San Jose Convention Center, a record number, and it was plain to see that the center's capacity was being challenged. According to show officials, ESC San Jose enjoyed a record number of attendees to its exhibits and classes at 15,000, despite a reduced number of classes at 138, down from last year's 144. Last year's show hosted 320 exhibitors and roughly 12,000 visitors. ■

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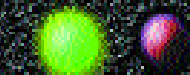
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More RTOS Developments From ESC

BY EDWARD J. CORREIA

SAN JOSE, CALIF. — As embedded Linux developers Microsoft and Wind River fight the battle for dominance in the embedded operating-system market, other vendors continue to develop their own solutions. With the Embedded Systems Conference here as a backdrop, specialty RTOS developers hawked their wares.

One such vendor was **Green Hills Software Inc.**, which released Integrity 3.0, the latest version of its royalty-free, memory-protected RTOS that has reportedly been enhanced to improve its reliability, security and testability.

According to Green Hills (www.ghs.com), Integrity 3.0 now includes enhanced multi-

processor Systems to make its QNX Neutrino RTOS available for free to the general public for evaluation, prototyping and other forms of noncommercial use.

According to Greg Bergsma, QNX's vice president of North

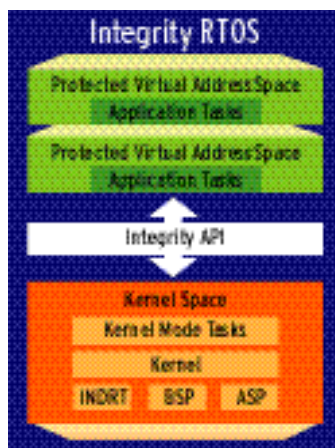
American operations, the move came in response to competitors. "We looked at what a lot of other companies have done to generate a following, and decided to do the same types of things," he said. But Bergsma

said that he realizes that it's one thing to get people to download a free product but quite another to get them to stick with it. "But we've got a lot of things to help people stick to our technology."

Since its posting on Sept. 26, the company said its RTOS has been downloaded more than 200,000 times, with about 50,000

coming on the first day. The free package is available at <http://get.qnx.com>, and includes the microkernel, file system and networking modules, a GNU tool-chain, a code-generating application builder, the Photon microGUI windowing systems and source code for many applications, drivers and libraries. ■

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Integrity 3.0 adds high-availability, enhanced debugging to RTOS.

processor debugging support, a new simulation environment and adds support for a variety of telecommunications and Internet protocols.

Integrity uses the hardware memory protection capabilities of MMUs to isolate the kernel and user processes into their own separate memory spaces, thereby preventing errant tasks from affecting kernel operations or other processes, the company said. The kernel, which can be stored in ROM, uses a pre-emptive, priority-based multitasking scheduler that the company says permits developers to assign address spaces with a fixed amount of physical memory, thereby preventing any single task from depleting resources and depriving others. Tasks also may be assigned fixed percentages of CPU time to guarantee deterministic behavior.

If you can't beat 'em, join 'em. That was the thinking behind the decision of real-time systems developers **QNX Soft-**



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Getting Your Appliances in the Matrix

BY EDWARD J. CORREIA

Can a washing machine tell your computer to remind you to buy laundry detergent?

Maybe not today, but embedded software developer Metro Link Inc. is attempting to pave the way with Matrix, the project name for a set of Java components that the company said will unite disparate appliance control standards and allow them to interoperate with Universal Plug and Play (UPnP), a multi-company appliance communication protocol initiative being driven by more than 250 consumer electronics, computing, home-appliance and networking companies.

According to Metro Link, Matrix will use Java classes to perform the multiprotocol translations necessary to bridge the Open Services Gateway initiative (OSGi); the Home Audio/Video interoperability (HAVi) standard; and VESA Home Network (VHN) protocols, thereby allowing home appli-

ances, computers, audio and video components and heating and air-conditioning systems to communicate with UPnP-enabled devices, such as computers running the UPnP stack.

According to Rob Lembree, technical director of automation products at Metro Link, Matrix is a flexible application framework that automates device communications as it converts

one protocol to another. "The framework that we're developing is protocol-neutral and extensible. As new protocols for automation come along, we'll be able to transcode between protocols and make a multiprotocol network appear as one."

Technically speaking, Matrix can be thought of as competing with Sun's

JINI, Lembree said, but added that Matrix is more flexible than JINI because it's not limited to communicating only with other JINI devices, as Sun's solution is. "We are implementing Universal Plug and Play and JINI, so our

customers will be able to have their device talk to both." Its initial release will not include JINI protocols, however.

And while Lembree conceded that a Java-based solution might not be the most cost-effective way to embed these capabilities into a relatively inexpensive appliance, the company is already working on alternatives. "A Java-based solution would

tend to require more memory and resources than an appliance vendor would be willing to put into a device," he said. To address this concern, the company is developing a way to embed its technologies directly "into any number of existing microcontrollers that are commonplace today," he said, "enabling devices to be UPnP-enabled at a very low cost."

When the product, which has yet to be officially named, is released sometime in the first quarter of next year, Metro Link (www.metrolink.com) will include a development environment and Java 1.1-compliant UPnP protocol stack. The microcontroller-embeddable version will follow soon after. Pricing has not yet been finalized, but the company estimates that royalties, which will be volume-dependent, could be as little as 50 cents per device. ■



As new protocols appear, Metro Link can build new converters, says Lembree.

Geodesic Has Remidi for Ailing Apps

Software tools company Geodesic Systems Inc. claims to have a cure for the memory-related problems ailing applications. In this case, the remedy is Geodesic Remidi 4.1, the company's latest set of plug-in libraries for Windows and Unix environments that enhance application performance and reliability mainly by improving memory allocation and reclamation, the company said.

According to Michael Spertus, Geodesic's founder and CTO, since Remidi focuses on memory management, it can be

deployed with no changes to program code. "We have a set of components that automatically improve the performance and reliability of applications, and you don't have to be a developer to put them in," he said.

Spertus said that Remidi also eliminates memory leaks, a problem caused when memory is not reallocated to the system when a program object is finished using it, and prevents memory from being freed prematurely. Both problems are particularly troublesome to embedded systems, which Spertus said are expected

to run continuously. In addition to efficient garbage collection, Spertus said Remidi replaces the host system's existing memory manager with what he called a "high-performance 'parallelizing' memory manager," which Spertus said can lead to dramatic improvements in performance and scalability.

Spertus said that Geodesic (www.geodesic.com) has done a lot of partnering with Sun and IBM on its Unix products.

Remidi 4.1 is available now; pricing is volume- and server-dependent. ■



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 **REASONING**

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iAnywhere Links With MobileBuilder 2.0 RAD Tool

Cross-platform IDE now can build Sybase-aware mobile apps

BY EDWARD J. CORREIA

Have you accessed a relational database from your mobile phone lately?

Thanks to a new software component developed by Sy-

base subsidiary iAnywhere Solutions for PenRight Corp.'s MobileBuilder 2.0, such transactions might soon become more commonplace.

The recently released Mo-

bileBuilder 2.0 is a rapid application development environment for Palm OS, Pocket PC, Windows CE, Windows 9x/NT/2000 and MS-DOS targets that now will feature the ability to

build "database-aware" applications that can take advantage of iAnywhere's enterprise mobile database infrastructure, a system that provides reliable, secure transactions from small, handheld devices, the company said.

At the core of the Sybase mobile solution is UltraLite, the small-footprint database compo-

nent that provides mobile devices with data storage and database synchronization capabilities. UltraLite stores changes made to a database while the device is offline and synchronizes with the main database later.

Chris Kleisath, director of engineering for iAnywhere Solutions (www.sybase.com/iAnywhere), said that until now, programmers needing such capabilities were stuck building their own. "Palm [for example] has a built-in flat-file storage mechanism, but doesn't have any of those types of characteristics," he said. "In addition to writing their own applications to solve their particular problem, developers would have to create their own database storage mechanisms. With UltraLite on those platforms, we can offer them an out-of-the-box solution for their data concerns."

What MobileBuilder brings to the table is a cross-platform development environment that is easier to use than Sybase's own SQL Anywhere Studio, Kleisath said. According to PenRight, authors of MobileBuilder 2.0, the IDE permits programmers to develop an application once and port it to any of its supported target platforms with the touch of a button. This is accomplished through a set of target-specific libraries created by PenRight (www.penright.com). The environment reportedly includes APIs for more than 350 handheld devices, and features a drag-and-drop forms designer, a handwriting-recognition engine and support for bar-code scanning.

According to Mike Paola, Sybase's manager of engineering product management, Sybase took advantage of the extensibility of MobileBuilder to integrate the UltraLite component. "It essentially provides our customers with an environment to develop their UltraLite applications. When it's put into the MobileBuilder environment, the component allows you to generate UltraLite-aware code and take advantage of transactional integrity and reliability characteristics."

MobileBuilder 2.0 is available now with the integrated UltraLite component, and is priced at \$1,595. ■



UltraLite is a solution for building handheld databases, iAnywhere's Kleisath says.

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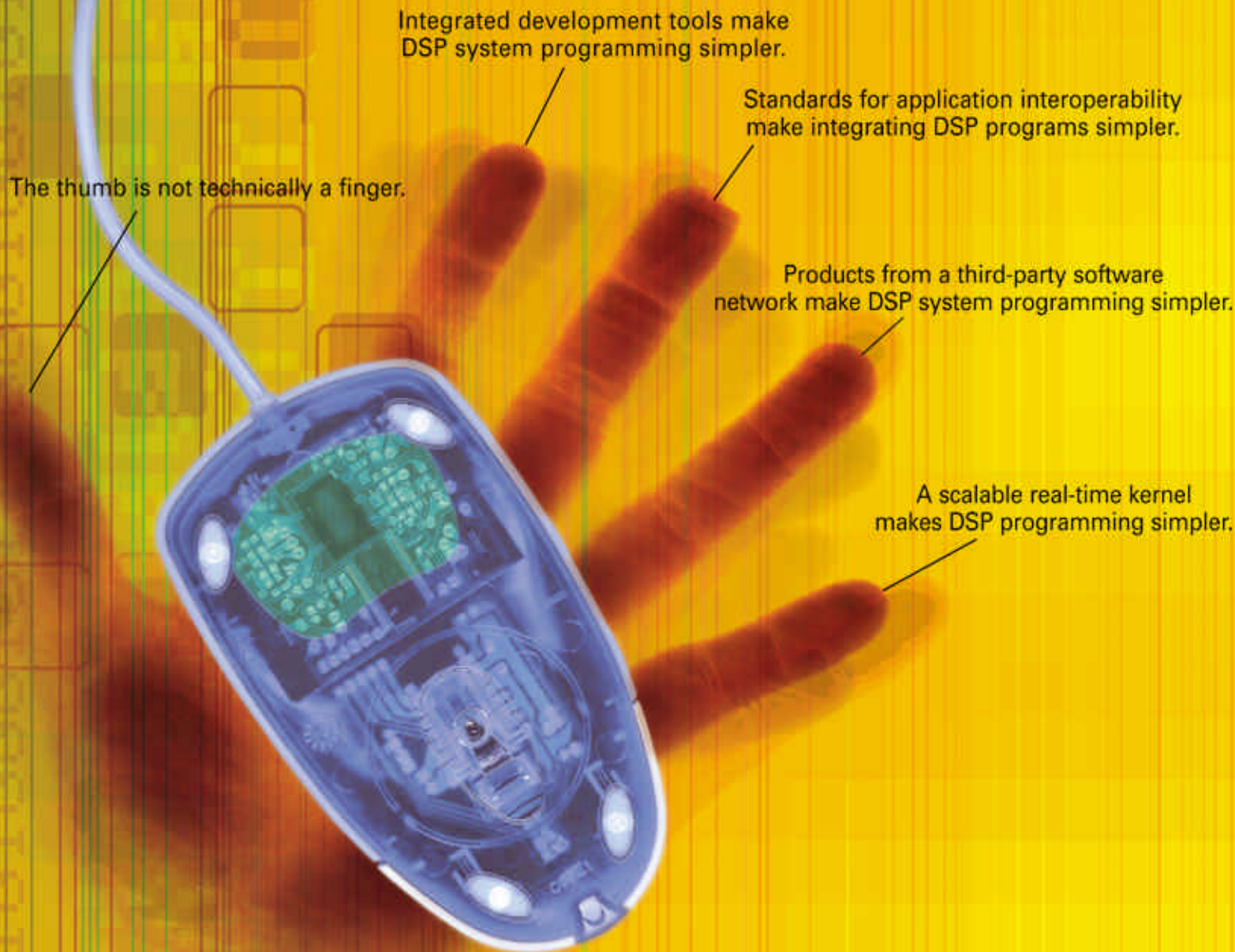
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EDITORIAL

Whither Unix?

“Is Unix Dead?” asked the September 1992 cover of Byte Magazine. The answer suggested by the magazine’s editors was that Unix wasn’t dead at all, and that in fact it was very much alive. Still, that wasn’t the first time Unix’s fate had been questioned, and it seems that every computing trend since that time has resurrected the issue.

Windows NT 3.1, some may recall, was pronounced the Unix killer. So was Windows NT 3.5, Windows NT 4.0 and Windows 2000. The bickering, lawsuits and infighting in the Unix camp surely would cause the operating system’s demise. The debate of CISC vs. RISC was largely framed as a referendum on Unix. And now the rise of the Unixlike Linux language brings up the point again: If you can have all the benefits of Unix for free in Linux, why pay for Unix?

In the case of Unix versions such as AIX, HP-UX, Solaris and Tru64 Unix, one reason is that those operating systems are tied closely to specific hardware platforms, as well as integrated with other IBM Corp., Hewlett-Packard Co., Sun Microsystems Inc. and Compaq Computer Corp. software and service offerings. (IBM has been the least successful in this regard, as its RS/6000 product family is less appealing to many enterprises than offerings from HP and Sun.)

By comparison, the cross-platform versions of Linux are, by design, not tightly integrated with specific hardware.

Another reason to buy into Unix is that one company, and one company alone, is responsible for a particular version of the operating system. Compaq, HP, IBM and Sun, as well as Berkeley Software Design Inc. and Caldera Systems Inc. (which is acquiring SCO’s Unix offerings), control the feature sets and release schedules of their operating systems. They can add new features as they see fit, either to improve the integration of the operating system with their other products or to respond to the specific needs of their customers. In most cases, the Unix vendors are also well-established companies with experienced field service and consulting organizations, which can help customers with all phases of application development, management and deployment.

By comparison, the horde of Linux vendors such as Corel Corp., Red Hat Inc., Stormix Technologies Inc. and SuSE Inc. are dependent on the Linux community, and Linus Torvalds, to determine Linux’s core feature set and create new versions of the Linux kernel. Because of that, the individual Linux distributions are differentiated not by the underlying operating-system software itself, but by improved installers, better sets of bundled drivers and packages, and by ever-more-complex service offerings.

In the final analysis, some enterprises enjoy having the option to build essential business applications on a platform that’s not tightly tied to any one vendor. For them, Linux provides lower costs and greater freedom of choice. Others prefer to use operating systems—be they Unix, Windows or even OS/400—and related tools that *are* developed, controlled, managed and supported by one vendor, end to end, with all the features and benefits that go with choosing a single business partner. For those companies, the 8-year-old question “Is Unix dead?” is still answered with a resounding “No.” ■

GUEST VIEW

WHERE IS LEGACY RENEWAL HEADING?

The prominence of e-business and of the Internet as its vehicle are undisputed. At times, however, the extended media coverage they receive overlooks most of today’s software systems, which constitute the foundation of the majority of business establishments that span the globe. These systems are traditional and haven’t even begun to tap into the technology and efficiencies of this new revolution. Furthermore, the road to an e-business world, in most cases, does not begin with the birth of a new “dot-com,” but rather with COBOL, which was the ubiquitous programming language of the past.

According to a recent study by GartnerGroup Inc., a majority of enterprise software applications worldwide still remains written in COBOL. IDC estimated the number of COBOL seats in 1999 at 1.5 million and predicted that it will continue to exceed 1 million well into this millennium. Nevertheless, I dare you to mention COBOL at an e-business event. I’ve tried and was struck by expressions of both confusion and perplexity at best, or queasiness at worst.

I am motivated by the fact that legacy renewal doesn’t presume to compete with cutting-edge technology, but rather aspires to complement it and to facilitate attaining it. Notwithstanding, the road to legacy renewal is bumpy. Technological gaps create obstacles that make this task difficult at times, as many of the systems usually encountered have been developed 15 to 30 years ago. These obstacles can be overcome, but it’s a daunting task nonetheless.

BACK TO THE FUTURE

Renewing a legacy system requires understanding and capturing the business value from within, so that a redesign or transformation can be performed in order to leverage and accommodate it to newer technological environments. Sound trivial? It did to us at first, but we have learned over the past three years that “modernization” and “renewal” are tricky words when dealing with legacy systems, as they intuitively mean moving immediately forward, whereas in reality,



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the opposite is true. They are more the equivalent of an archeological dig than anything else, and are comparable to traveling back in time to the age of our programmer forefathers and ancestors in search of a key in leveraging both their efforts and their employers’ tremendous investments to 21st century technological standards. The reason for this is that while the deliverables of legacy renewal projects are usually quite clear, analyzing the legacy system, extracting its business logic and re-engineering it are the most challenging tasks and require the most attention.

There could be, of course, another version of “legacy renewal”—one that we are not keen on endorsing. I am referring to various face-lifting solutions known as “screen scraping,” which can easily help replace the legacy presentation layer and produce a graphical front end with connectivity to the legacy back end. Screen scraping is usually based on proprietary middleware, which intercepts the front end of the legacy system and generates a GUI on top without touching the core modules of the legacy applications themselves. Albeit providing a low-cost and immediate solution for adding that glossy Web coating, screen scraping is more like its nickname, “lipstick on a pig.” It’s a good solution for some cases, but it’s not renewing per se. It focuses more on the cosmetics and does not address many of the core issues concerning legacy systems that actually prompt considering modernization initiatives.

For one, consider the shrinking talent pool of legacy programming language professionals. How many computer science students do you know who study COBOL, Natural, PL/I or RPG? With the average age of a COBOL programmer today being 47, who will maintain these systems 20 years from now? Other issues concern obsolete technology, isolation and the lack of compliance with today’s industry standards—all of which impede e-business integration.

It is true that renewing a legacy system can be easier when it doesn’t involve restructuring or

re-engineering it. The alternative, however, is to abandon the effort to really leverage its existing core to e-business, thereby leaving no choice but to add additional layers of middleware complexity to its infrastructure while remaining with the above-mentioned issues at hand. Yes, modernization requires a bigger leap, but it does not have to be made all at once, and can be achieved through a phased approach to make the technological transition a smoother one.

ONE TIER AT A TIME

There are organizations, for example, that seek a GUI substitute for an old mainframe “green screen,” but only as part of a more thorough effort to re-engineer their typically monolithic one-tier mainframe architecture to a client/server or three-tier paradigm for attaining increased flexibility and scalability.

To perform this architectural transition gradually without adding to the system’s intricacy, the legacy interface (commonly a set of files—each producing different user screens) can be identified through an automated application survey and addressed as a separate tier. The application’s current logic and presentation layers residing on the mainframe may continue to remain intact, functioning exactly as they did before. A replica of the presentation files would be converted to a more modern language in order to generate a GUI (ideally Java, which can provide for necessary cross-platform interoperability). This replica would then be deployed separately on an application server, to communicate with a thin client on one end and a transaction gateway to the mainframe on the other.

More difficult renewal tasks often involve extracting business rules from the legacy logic, which are the building blocks of the application’s functionality. Business-rule identification and extraction can be done using programmatic heuristics for filtering out code redundancy and overhead, zooming in on the code that really matters to the business and capturing those logical clusters of code that define the rules.

Finding those rules involves code pattern recognition, control-flow and data-flow analy-

► continued on page 25

AND ANOTHER THING...

EMBEDDED LINUX OR LINUX EMBEDDED?

One of the new hot buzzwords you are hearing about is "embedded," frequently coupled with the word Linux. Many of the Linux vendors have realized that embedding their software in millions of VCRs, even at a tiny run-time royalty, can add up fast. The idea with embedded Linux is that the main operating-system kernel is free, it's supported by The Movement, and you can just pay for your tools and/or services. Of course, you pay for those \$50,000 to \$100,000 worth of services upfront, before you ship your VCRs, not after you've sold them.

Linux vendors have flocked to the embedded market as if it were made up of thousands of engineers foolishly overpaying for stuff that should be free. I have news for the Linux embedded vendors: It's not that easy. We can break the contenders into two groups, with the first name representing the vendor's background: embedded Linux vendors who have battled in the embedded market for years, and Linux embedded vendors who are try-

ing to migrate their successes in the desktop/server world to embedded systems.

The embedded market is a strange, well-entrenched market that flies below radar and doesn't take well to strangers. Over the years, I have watched a steady succession of companies, software and hardware, try to stake a claim in the embedded world. More often than not, they get chased out by the unique requirements of an embedded



TED
BAHR

system: the need to be debugged to perfection; frequent marriage of hosts to different target chips; minimizing the functionality of the operating system (and often writing one); a kind of real-time not defined as simply really, really fast; and bare-metal coding to

try to squeeze the application down onto a smaller, cheaper chip. This is not recommended for small children.

Companies like Borland, Microsoft and Novell have tried to get into the embedded market on and off for years. The conservative nature of embedded developers, who are as like-

ly to be engineers as programmers, has created a market that evolves very slowly and eyes newcomers with great suspicion.

For example, Microsoft has spent upward of \$100 million developing and promoting Windows CE, yet the platform has achieved a disappointing 1 percent market share. While CE is its strongest offering, Microsoft has been showing up at the Embedded Systems Conference since 1989, with lonely booths, barely manned and universally shunned. There's no strong anti-Microsoft sentiment; there's simply no sentiment at all. Embedded systems designers didn't need 95 percent of Windows' functionality in their products, and so Microsoft just wasn't a factor.

So perhaps it's not so strange, this embedded Linux fever. Maybe it's another reflection of the open-source movement's "Anyone but Microsoft" chant. The Penguinistas see the embedded systems market as another vendor-neutral country ripe for their evangelism, and maybe even some commercial sales.

Embedded devices, such as Internet appliances and handheld devices, are increasingly included in systems that integrate into native enterprise systems. As companies build these

enterprise-to-embedded systems, there is a growing legion of IT software development managers learning the players and idiosyncrasies of the embedded market. If you're one of them, be careful not to leap into the arms of Linux companies with little experience in the embedded world because they, too, are learning the idiosyncrasies—many times the hard way.

My advice? Don't reject proprietary solutions out of hand. And if you choose to go with embedded Linux, look for the vendors that bear the lumps and scars from helping companies like yours build embedded systems for many years.

Look under the hood of companies like MontaVista or Lynux-Works, and you'll find embedded industry veterans who will help you avoid the mistakes too easily made when building embedded systems. Meanwhile, the embedded Linux movement has encouraged longtime experienced embedded suppliers like Wind River and QNX to adopt more aggressive front-end pricing models. There have been many hot buzzwords over the years in the embedded systems market, but none are as valuable as this one: experience. ■

Ted Bahr is publisher of SD Times.

LETTERS TO THE EDITOR

EBXML AND SOAP

There are some significant inaccuracies in your article ("Final Messaging Services Spec Due From ebXML," Oct. 1, page 1).

The version of the spec we are publishing in November is not the final version; there will be later versions published before the project is complete.

If you look at the spec, you will clearly see that it says draft. I agree that SOAP isn't in the current spec and that MIME was selected since. The main reasons are MIME, rather than XML, is "right now" (notice the emphasis) the only "standard" (notice the emphasis again) way to digitally sign and encrypt documents; and we wanted to

oriented and semantically coherent code.

Many COBOL programs, for example, are lengthy, cumbersome and contain unnecessary "code debris" accumulated over time.

All in all, I would say that if there were an oxymoron to be attributed to this business, the most appropriate one would be "modernization archeology." Moving legacy systems forward should be done comprehensively, carefully and in small steps. ■

Assaf Kedem is the marketing director of Intercomp Ltd. He can be reached at akedem@legacy2web.com.

have one way of encapsulating/wrapping/enveloping electronic data, XML or not.

I and others think that convergence between ebXML and SOAP is quite possible as a result of the W3C XML Protocol activity, but this hasn't started yet!

David Burdett
Editor
ebXML TRP

DEATH OF THE PROGRAMMER

I enjoyed Ted Bahr's column ("Death of the PC Programmer," Oct. 1, page 19) so much because it reminded me of where we have been. I thought I changed because of all the grad classes that I had taken and didn't realize the changes from the "good old days" were pretty much happening across the whole industry.

Co Ho
Software Development
Services Coordinator
Fullerton College

DEATH REDUX

I greatly enjoyed Ted Bahr's article. Excellent observation and flawless deduction leading to a logical conclusion: that the

latitude of individual programmers to buy their own tools is giving way to enterprise-wide standardization.

However, I would like to offer a data point to the contrary. Here at Perforce Software, we have experienced a rapidly expanding demand for our Fast Software Configuration Management System, which sells in the sub-\$1,000 tools space. We conduct our business directly and almost exclusively with software developers—rarely a manager or a vice president in sight...Growth within an organization appears largely driven by individual team members who are eager to share their success with others. Clearly at least one software company still caters to these PC programmers, dead or alive.

Nigel Chanter
COO, Perforce Software Inc.

CORRECTION

An article in the Oct. 1 issue ("Help Is on the Way From Forefront," page 7) incorrectly listed the Web address for ForeFront Inc. The correct address is www.forehelp.com.

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Alan Zeichick

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Here at Stormix we know that the **Linux** operating system is incredibly **stable**. Storm Linux runs our servers, workstations and laptops. We work in a power-user environment, and system crashes are very, very rare. So we started a little informal contest to see how long a Linux system can run without needing to reboot. An **endurance** race, of sorts. But something always happens to mess up our contest. Someone might move desks or have to install new hardware. John's computer was in the lead. Then he accidentally unplugged his machine. Whoops. This is a pretty **competitive** place to work, so John's employment with Stormix was subsequently terminated.

(Just kidding ... John's computer was actually in second place.)

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(And seriously, John still works here. But in a more limited capacity. :-)



www.stormix.com



Unix Market Consolidates

Sun, HP lead in revenue, SCO and Sun lead in volume

BY ALYSON BEHR

The fight for operating-system domination has been by all accounts brutal. It's about to get bloodier—and the market share tide may change—thanks to a number of initiatives mounted by several key Unix manufacturers.

Fragmentation of the Unix market in the past has been caused by various factors, including single vs. multiple architecture support, available marketing resources and the ability of a particular flavor to generate and maintain revenue streams.

Bill Claybrook, research director for Linux and open-source software for the Aberdeen Group who also closely follows the Unix market, said Sun Microsystems Inc.'s Solaris garnered 38 percent of the revenue-based Unix market in 1999, followed by Hewlett-Packard Co. (24 percent) and IBM Corp. (16 percent). Volume-based market share for 1999, or number of licenses sold, shows a markedly different picture. Santa Cruz Operation (SCO) has roughly 40

percent of that market, while Sun has 22 percent and HP-UX has 11.4 percent.

The market share of Berkeley Software Design Inc. (BSDi) is harder for analysts to track. According to Claybrook, "A few million people out there are using Free BSD, and there are millions and millions of people using one of the BSD versions, but it doesn't have the brand recognition that the others do,



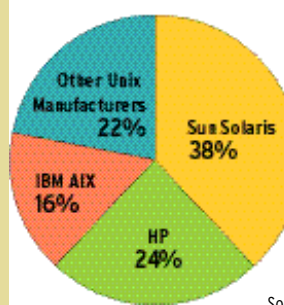
BSD lacks brand recognition, says the Aberdeen Group's Claybrook.

and the groups involved in developing the BSD versions of Unix don't seem to be interested in pushing it in that direction either." BSDi has recently beefed up its marketing, and it appears to be paying off.

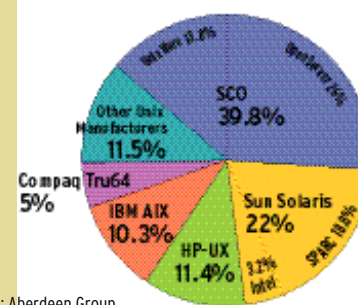
Sun, the company with arguably the most formidable marketing machine, has added several new features to Solaris 8 and is maintaining a strategy of directing its marketing focus on the operating system and its SPARC platform.

Robby Iyer, directory and security product line manager for the Solaris

1999 Unix Market Share Based on Revenue



1999 Unix Market Share Based on Volume



Source: Aberdeen Group

product marketing team, said, "In Solaris 8, there are several new features we've added in the area of security—specifically support for IPSec—and we've made available a firewall as an access piece in our latest update. IPv6 support is also one of the newer key features."

Chris Ratcliffe, Sun's group manager for Solaris software, added, "The bottom line for us is that we want to improve service levels but reduce the costs and risks associated with doing that. One of the biggest problems we face when not just integrating security features but engineering any new features, is not breaking customers. So the

biggest obstacle we face is to engineer the updates in such a way that customers can make use of the new functionality but not necessarily have to recompile new applications or buy new ones." Solaris 8 also provides users with an internationalization framework that

allows for application design that will operate in almost all language environments—including European and Asian as well as double-byte languages like Arabic, Hebrew and Thai—across different Unix platforms as well as Linux. Although Solaris 8 is bigger and slower than earlier versions, users can install specific functionalities to suit their needs, thereby saving precious server space and speeding up performance.

Sun believes its position in the market is well protected. However, this confidence may serve as its Achilles' heel if the result of a joint project by

► continued on page 29

BSDi: UNIX'S BEST-KEPT SECRET

It's no secret that the best technology in an industry doesn't always make the "Survivor Final Four." In most cases, it's the product with the behemoth marketing machines that survives the longest and makes the greatest market-share headway. However, Colorado Springs, Colo.-based Berkeley Software Design Inc. (BSDi) not only has been able to survive the onslaught of IBM Corp.'s and Sun Microsystems Inc.'s seemingly limitless marketing resources, but recently also rebooted into comeback mode. The company, which has not been well known outside the industry, tripled in size in late 1999 to more than 100 employees, with combined revenues in excess of \$26 million in 1999 and \$8.2 million in the first quarter of 2000.

BSDi was founded in 1991 by Michael Karels, now the company's chief technology architect and a former leading scientist at the Computer Systems Research Group (CSRG) at the University of California, Berkeley, who worked on the original development of Unix.

CSRG was initially organized with the idea of making Unix source code more readily available, so in 1991 it got permission from the Board of Regents at UC Berkeley to distribute the code, calling it the Berkeley Standard Distribution (BSD), and formed BSDi. Shortly thereafter, it became engaged in a lawsuit with AT&T, whose Unix Systems Laboratories considered itself the sole owner of Unix and believed that BSDi was infringing on its intellectual property. The lawsuit was settled in 1993, shortly after Novell Inc. acquired Unix System Labs from AT&T.

Out from under the strain that is a normal byproduct of litigation, BSDi in 1994 made the strategic decision to beef up its sales force and target Internet service providers. As a result, over the years the company recruited several new executives with strengths in marketing. Most recently in December 1999, it brought in a new chief executive officer, Gary Johnson.

Mark Garver, group executive of marketing and Internet systems solu-

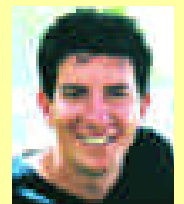
tions at BSDi (www.bsdi.com), attributes the company's comeback primarily to the burgeoning open-source movement, saying, "The open-source movement is becoming much more mainstream, which has allowed us to go out and ride that wave that was created by all the Linux companies going public. With Linux hitting the mainstream and with BSD being sort of the grandfather of the open-source movement, it really gave us the opportunity to go out and let people know where we were by leveraging relationships like the one we have with Yahoo. For instance, Yahoo founder David Filo runs all of Yahoo on Free BSD."

Another possible reason for its recent resurgence is two acquisitions—Walnut Creek CDRom and Telenet Systems Solutions—that were made to support BSDi's growth strategy and product line. A \$5 million investment from Yahoo Inc. also has fueled the comeback.

BSDi's four product offerings support both Intel and Sun SPARC technology and are developed from the BSD/OS code. They include Free BSD, Net BSD and Open BSD as well as BSD/OS. Garver explained, "Open BSD is a spin-off of

Net BSD and is primarily focused on doing research into Unix security, while Net BSD really takes Unix and ports to it as many different platforms as we can. Today I believe it supports 26 different platforms." Garver added, "Free BSD was positioned as 'the Unix for the Masses' so it incorporates all the best of all worlds, but it's something that people have really wanted to use to roll out large Internet sites because they can depend on its stability."

Garver is very clear on where BSDi's future lies: "Our primary focus today is really trying to get the BSD camp all lined up into one cohesive movement and create a synergy there and get BSD back where it existed. Today there are four flavors of BSD, all binary compatible. We really want to make it an easier choice for the customer to look at BSD as a whole, as opposed to having to decide which of the BSDs will suit their application needs best."



The open-source movement aided BSDi's comeback, says Garver.

—Alyson Behr

Unix Vendors Cozy Up to Linux

BY ALYSON BEHR

The big news in the server operating-system industry can be summed up in one word: Linux. A recent IDC report shows 1999 Linux shipments tallied 1.3 million and forecasts shipments of 4.7 million by 2004. In addition, the report shows overall server operating-system revenue growth will remain a paltry 1 percent, while Linux revenue growth is predicted to significantly outpace the pack through 2004 at over 23 percent. Linux revenues will still take second place behind the Windows operating system but are predicted to be around \$85 million for 2004. These figures and the demand for open-source support have not been overlooked by Unix manufacturers such as Berkeley Software Design Inc. (BSDi), IBM Corp., Santa Cruz Operation (SCO) and Sun Microsystems Inc., which have decided that it's in their best interest to position themselves in one way or another to take advantage of Linux's growth in popularity.

What's especially interesting are the different ways Unix players have chosen to enter the Linux arena. Bill Claybrook, research director for Linux and open-source software for the Aberdeen Group, said, "IBM and HP are both supporting Linux along with their Unix products in a big way. I think some of these companies

have realized that Linux is growing, and they'd like to get into the act, especially the ones in second and third place like HP and IBM. They want to be able to sell more hardware, and I believe they see Linux as an alternative to Unix, especially on the low end...and also as an alternative to Windows 2000 as a means of selling their hardware." He added, "Some of IBM and HP's interest in Linux is that although their relationships with Microsoft are okay, Microsoft is not an easy company to work with. They see Linux as a way of continuing to sell hardware, and it's just easier to work with the Linux community than it is with Microsoft. On the other hand, Compaq has the closest relationship of any of the top companies with Microsoft, and as a result you find them talking less and less publicly about their Linux strategy."

Most of the major Unix players have been making money off operating-system sales, so increasing revenue through strengthening sales channels and customer bases or diversifying product offerings has been the main reason for cozying up to Linux—not survival.

Ross Mauri, vice president of Unix software for IBM's enterprise systems group, addressed IBM's commitment of resources toward its Linux customer base,

saying, "We continue to have a very significant and growing investment in our Unix/Power-based business. What we've added to that are investments in Linux, including a number of open-source projects going on where we're making enhancements to the Linux kernel and giving that back to the Linux community, and also taking Linux and ensuring that it runs well on our S/390 and Power PC architectures. So our Linux investments are net add and are growing."

When asked about Sun's position on Linux, Chris Ratcliffe, Sun's group manager for Solaris software, said, "We think Linux is a great OS. It's taken a lot of business away from Microsoft, which is a good thing; it's introducing more people to the Unix community, although it's not necessarily Unix; and it's raising the awareness in the marketplace that Windows 2000 doesn't have the capabilities that Unix does." He added, "The fact that the OS is free is attracting a lot of people to Linux, but it's also attracting a lot of people to Solaris B," a binary version of the operating system for which the license is free. When pressed, Ratcliffe admitted, "Sun as a corporation does not produce a Lin-

ux product. Our Linux strategy is to work with third-party vendors. Sun has one singular vision; that is SPARC and Solaris."

FROM SCO TO CALDERA

One vendor not increasing its Unix revenues is SCO, which at one time had roughly 40 percent of Unix market share but has lost ground to Sun and fallen into financial difficulty of late. It found a solution through sales of its Unix divisions to Caldera Systems Inc.

Sources at both companies cite consolidation benefits that include increased sales channels, larger customer bases for similar, compatible operating systems, complementary product offerings as well as similar marketing strategies and technology mindsets. John Palmer, marketing vice president of SCO's server software division, said, "The transaction is predicated on a desire on the part of Caldera to acquire a worldwide infrastructure and experienced channel management group that has generated a hundred million plus worth of revenue on software products."

He added, "There really isn't another Linux company out there today that can boast having as large a loyal channel following and as large a support community as SCO has, so therefore it was reasonable for

► continued on page 29



Caldera's Tamang is hopeful that the SCO acquisition will benefit the Unix market.

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UNIX CONSOLIDATES

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other leading Unix players spearheaded by IBM hits the jackpot in early 2001.

DO YOU KNOW THE WAY TO MONTEREY?

The Monterey Project, named after IBM's Monterey, the code name for its next-generation version of AIX, was initiated to gain the high ground and make an early play for x86-based Unix market share from Sun and HP.

Key players and their contributions besides Intel and IBM, which contributed its AIX kernel and system management tools, included Sequent Computer Systems and its DYNIX/ptx with multipath I/O and NUMA capability; SCO, which ponied up Unix System V technologies from UnixWare along with Intel systems expertise; and Bull, which provided scalability and workload management support.

Ross Mauri, vice president of Unix software for IBM's enterprise systems group, said, "As a development partnership, IBM carried the majority of the weight in the development, but I think that was just because of the relative size of the companies and what we can afford to contribute." The result of the project is AIX 5L, an operating system that will run on RISC, the IBM Power platform,

its RS/6000 server line, Bull's Power-based servers and Intel's IA64 architecture. In addition to being able to run on multiple platforms, Mauri said, "there'll be IPv6 support as well as multilingual, including double-byte language, support."

By the close of the project, Sequent had been acquired by IBM, and SCO, which had been experiencing financial

difficulties, found its Unix software divisions sold to one of the leading Linux players, Caldera Systems Inc., maker of OpenLinux.

The overall success of the Monterey Project may well put a serious dent in Sun's revenue stream, especially on Intel platforms, but that remains to be seen until after Intel releases the IA64 Itanium chip, which has been delayed more

than once. On the other hand, the IBM Power version isn't tied to the IA64 release and is available now. Many customers who find Microsoft difficult to deal with and who have no compelling reason to hold off making their purchasing decisions may opt not to wait, in which case they'll still have a choice to make: Solaris, AIX 5L, BSD/OS, HP-UX...or Linux. ■

UNIX AND LINUX

◀ continued from page 28

Caldera, given the climate and environment, to acquire a partner who could contribute those things."

Palmer said, "We as a company were looking at technology that was growing older in the marketplace. We had actually announced intent to have our own Linux distribution. This was to reinvigorate our product set with the latest technology, take advantage of the latest applications and latest development tools. We needed a partner like Caldera to accelerate the process."

Benoy Tamang, vice president of business development at Caldera, said he hopes Caldera's acquisition of SCO will affect the Unix market for the better. "There is an overwhelming level of respect that the Linux crowd has for Unix and the fact that in the years of longevity and development cycle, we acknowledge the pedigree that Unix has. As we go forward as a combined new company, we will continue to have a separate Unix line and market OpenServer and a separate Linux line of solutions. Where possible, we will attempt to bring the best elements of one side to the other, both ways," he said.

With the recorded growth of Linux as a proven, robust solution as well as a viable source of revenue, and the rush toward open source, there's likely to be more harmony in these Unix/Linux marriages than discord in the foreseeable future. ■



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News Briefs

MORE PRODUCTS

◀ continued from page 7

ment and administration of large or widely distributed server-farm environments; a management console with single-point command and control of Citrix server farms and licenses; and integration into third-party management frameworks. Pricing is not available at this time

... Qarbon.com has released **ViewletBuilder2 2.1**, its free development tool for creating Viewlets. Improvements include Linux and Solaris versions, work-flow and interface

improvements, greater stability, better audio quality and redesigned and enhanced interactive features. The new features, available at www.qarbon.com, precede the company's Viewlet Guide, now in beta, an Active Server Pages learning program

... Apogee Software Inc. has released its **Aphelion** integrated development environment for creating and deploying Java-based embedded system applications within IBM Corp.'s PowerPC 405GP embedded processor running MontaVista Software



Inc.'s HardHat Linux. The IDE works in complement with Sun Microsystems Inc.'s CDC

(Connected Device Configuration) J2ME VM within the 405GP/HardHat Linux environment ... Mabry Software Inc.'s **ListBar/X** is a user-interface ActiveX control that provides applications with a user interface when copious amounts of information need to be presented. Price is \$99, with a package including Listbar/X and its C++ source code going for \$199 ... Microsoft Corp.'s **MSXML Parser Beta Release 3.0**, which offers a complete implementation of XPath/XSLT, server-safe HTTP access, and change to the SAX2 implementation that becomes a unique class for both C++ and Visual Basic interfaces, is available at <http://msdn.microsoft.com/xml/general/msxmlprev.asp> ... Serena Software Inc. has released **StarTool 6.2**, an upgrade to its StarTool environment for editing and managing many types of files, including DB2 and VSAM. StarTool 6.2 adds security features, easier-to-use search capabilities, additional VSAM editing support and increased compliance with standards. Licensing fees start at \$25,000

... WebGain Inc. unveiled its **TopLink for IBM WebSphere**, an object/relational database mapping technology that permits programmers to easily integrate Enterprise JavaBean (EJB) applications to relational databases on the IBM WebSphere Application Server, Advanced Edition v. 3.5. Offering programmers a scalable container-managed persistence environment, the technology also features full interbean relationships, caching options, a system for complex object-level queries and dynamic finder methods. Pricing was not available.

PEOPLE



SILVA

Joseph Silva has been appointed director of worldwide services and system engineering for Upspring Software Inc. Formerly with Wall Data/NetManage Inc., he will be responsible for managing the technical engineers in writing presales applications, as well as managing the company's post-sales consulting group. He

reports to Upspring's **Joseph Noonan**, vice president of worldwide sales ... **Steven E. Jones**, formerly of Hyperion Solutions, has joined PointBase Inc. as vice president of engineering. Jones will

lead the technical development of the company's Java databases, and data management and synchronization products ... Corel Corp. has announced that interim president **Derek J. Burney** has been appointed as the company's permanent president and CEO, replacing **Michael Cowpland**, who resigned earlier this year. In addition, **Ian LeGrow** has been promoted to executive vice president, creative products; **Graham Brown** has been promoted to executive vice president, business products; **Rene Schmidt** has been promoted to executive vice president, Linux products; and **Annette McCleave** has been promoted to executive vice president, corporate marketing, where she will oversee the company's branding and identity

... Tadpole Technology Inc. has appointed **Brian Morrow** as president and chief operating officer of its Endeavor Technology Inc. Web software business unit. Morrow will be responsible for spearheading the development of the company's Magi software for peer-to-peer information exchange. ■

CODE & CONTENT

◀ continued from page 1

Rational (www.rational.com) has exclusively licensed Vignette's server and bundled it with components of the Rational Suite to create a new product called ContentStudio. With the Vignette CMS, customers will get Rational Site Load and the new Team Unifying Platform, which consists of Rational Unified Process, Requisite Pro for requirements management, ClearQuest for defect and change tracking, and ClearCase for configuration management. "Content managers will use the Vignette tool for templates to create content, and business partners can contribute to it," said Rational senior vice president Eric Schurr. "Programmers will use ClearCase and the other tools."

Schurr explained that there were two different work flows separating code and content, with developers working under a build-test-deploy paradigm and content managers using a write/edit scheme. The integration within the new ContentStudio provides a single user interface, but one that is familiar to content managers rather than making them work in an environment more appropriate for developers. The key, he

said, is that all content, code and artifacts are managed in a parallel process and deployed in unison.

ContentStudio is expected to be available by April 1, 2001, at a cost of \$4,795 for a node-locked license and \$8,395 for a floating license.

The StarBase solution centers on the first release of CodeWright, now version 6.5, since StarBase (www.starbase.com) acquired Premia Corp. last March, and integrates the code editor with the StarTeam code management environment and the V/5 server through an integration module. "The difference is that Rational's new product bundles our technology with theirs and creates a single, seamless product with quite a different level of functionality," said Vignette's Daniel.

StarBase product group vice president Lydia Patterson said, "We want to create a single collaborative environment involving the marketing, sales and product managers at one end, through the graphics design and content people, to the Webmaster who's designing the pages, to the software developers writing code for new Web pages while hooking into legacy

back-end systems for presentation on a Web page."

Perhaps the most significant new change to CodeWright in this release, according to senior product manager Jim Stevens, is



An intelligent agent reduces errors prior to compiling, says StarBase's Stevens.

the addition of an intelligent agent called CodeSense for Java, which complements the existing CodeSense for C/C++. Stevens explained the agent allows developers to find symbols and syntax of a function. "The mouse hovers over an incomplete function and shows what is needed to complete the function,"

Stevens said, adding that the benefits of the intelligent agent include a reduction of errors prior to compiling and the freeing up of developers to work on the code and not have to worry about language syntax.

Other changes to CodeWright include the addition of a WYSIWYG viewer for monitoring changes, an XML viewer and the addition of chromacoding tools called lexers for C# and XML that identify functions, variables and attributes in a colored scheme. Also, Stevens said, more COBOL support has been added.

CodeWright 6.5 is priced at \$299 and is available now. ■

MAINWIN

◀ continued from page 1

Linux and Unix compilers to create native applications. "This way, [development teams] won't have the problem of being up for Windows and not have other platforms available for months," said Jeff Miller, director of marketing at Mainsoft (www.mainsoft.com). "It used to be developers had one core platform and a lot of other headaches. Now, it's multiple platforms and same-day release. All the feature sets are the same."

Among the problems development managers have faced with porting applications are API differences; platform technology differences such as COM vs. CORBA, ADO vs. ODBC and the Windows GUI vs. Linux and Unix GUIs; differences between C++ compilers; and differences in development tools. "Each IDE is different and creates knowledge gaps within the development team," said Andy Milo, Mainsoft's senior technical account manager. "Also, Unix

compilers are very strict. They want things to be exact. Visual C++ compilers are more pragmatic, more relaxed."

MainWin solved the problems of having to port a build environment and worrying about C++ nuances, Milo said. Visual MainWin, he said, is "Windows on Unix. We have the Win32 APIs and ODBC support, as well as XML, COM, DCOM, a Java-COM bridge."

Visual MainWin is made up of two components. The first is an SDK that includes a cross-platform add-on to Microsoft's Visual Studio. The second is the Visual MainWin run-time platform, which includes several million lines of Windows source code acquired through an agreement with Microsoft. "We're targeting the true NT shop that doesn't want to have to think about Unix," Miller said. Mainsoft is one of only two companies—Bristol Technologies Inc. is the other—with access to the source code under the Windows Interface Source Environment agreement. Mainsoft's implementa-

tion of the Win32 APIs sits atop a Linux or Unix kernel, and the source code, in DLL form, sits atop the MainWin implementation, Miller explained. The source code is not open, nor is it available to customers of Mainsoft, he said.

Visual MainWin for Solaris, released last month, is the first iteration of Mainsoft's e-porting initiative, with versions for AIX, HP-UX and Linux due out in the first quarter of next year. The e-porting strategy will take on an ASP look and feel, with only a client-side PC with Visual Studio needed to access the Visual MainWin platform residing on a server.

The Visual MainWin SDK includes one developer license for a specific Unix or Linux platform, three additional QA licenses to test and debug the application, and one year of technical support for \$2,495 per developer per platform. Additional licensing is required before deploying each ported application. A 100-user deployment is \$47,500, while a 1,000-user deployment is \$128,000. ■

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MetaRecon 2.4 Adds XML to Speed Tools Communication

BY DOUGLAS FINLAY

For managers and programmers involved in ongoing data migration projects, such as converting mainframe applications to *n*-tier applications or building customer relationship man-

agement applications or data warehouses, Metagenix Inc. has added XML capabilities to its MetaRecon 2.4 enterprise data management integrated development environment to enable programmers to send metadata

between and among tools.

Greg Leman, Metagenix's (www.metagenix.com) CEO, explained that for programmers dealing with data migration issues, the problems of extensive coding and intricacies of

installation are secondary to the problem of getting the correct data out of an existing system and into a new application. "In each of these complex data areas of the enterprise, such as data warehousing, customer

relationship management, e-commerce applications and data mining, for the transformation of information from one application to another application to function correctly, there needs to be an understanding of the metadata residing within the application," Leman said.

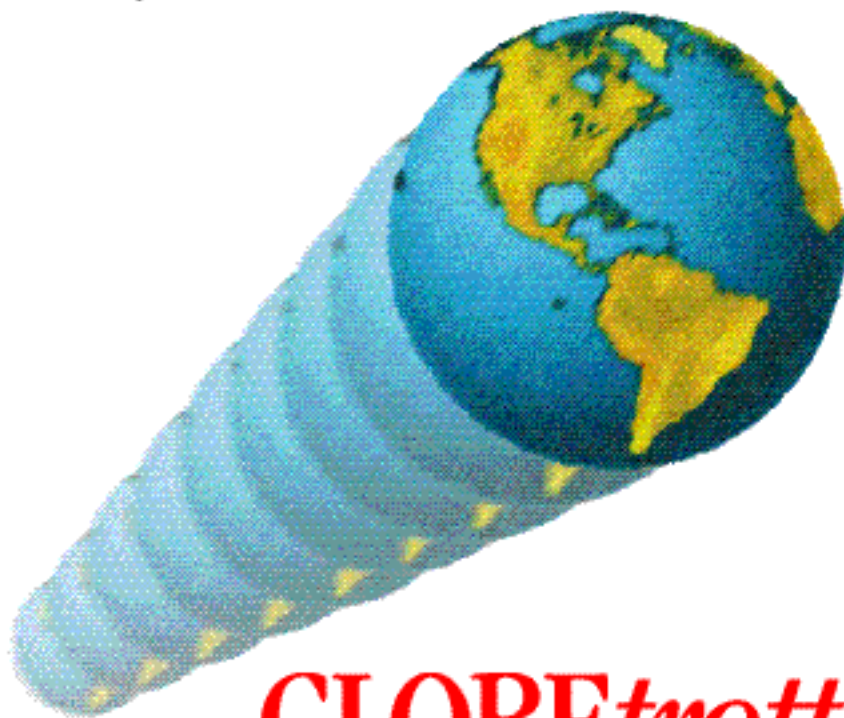
But the problem, Leman continued, is that most people don't have a good working knowledge of the data in their applications, and end up looking through source code, interviewing people or trying to figure how the data is laid out. "And the biggest problem in looking at source code for business logic is that often it is wrong, or it has changed over time."

Instead, MetaRecon creates metadata from the raw data of the source applications that's been loaded into the program by reverse-engineering it, providing the programmer with both the real data of the source application and its structure in order to generate new applications. "The program will tell you data types and the data masks, such as integers, characters and cardinality," he said. "And there's really no way to do these new applications without understanding the data from the original source application." He also said the program will do things such as primary keys, foreign keys and intersections between tables so programmers will know the relationships among different elements in the enterprise. "If you've got a shipping application and an order fulfillment application, there will most likely be a relationship between files of these two applications, and MetaRecon will find it."

But while one of XML's primary functions is to provide metadata, Leman said, "XML won't tell you the relationships between objects in the database, and programmers won't know that one field is a primary key in table, or that one field is related to another within the table." Rather, MetaRecon incorporates XML to convert metadata into an XML format to be transported quickly among the e-commerce and middleware tools. "Tools such as extraction, transformation and load are programming environments for doing data movement, and XML enables the exchange of metadata within those tools," Leman said.

MetaRecon 2.4 with XML capability costs \$250,000 for two servers and a client. ■

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d-Tracker Provides Web-Based Defect Management

Adds browser interface to RSW's e-Test Suite for remote tracking

RSW Software, a business unit of Empirix Inc., has released d-Tracker, a Web-based defect tracking server tool that works with RSW's e-Test suite to help log Web site problems and then route bug reports to the appropriate developer for resolution.

Roberta Braum, RSW Software (www.rswsoftware.com) product manager, said that d-Tracker was intended as a natural extension of the company's e-Test suite. "d-Tracker provides a way of storing and managing data, and creating a work flow that deals with issues or problems found on the Web site, transferring information about those problems to Quality Assurance and then to developers, who attend to the problem

and then send results back to QA for further testing," she said.

She said Web site issues such as missing images, connection errors, missing links and

search failures are all recorded by e-Test suite and listed in the d-Tracker screen. She said that bar graphs depicting load-balance problems and screen

shots—showing other types of software defects—could then be sent as e-mail attachments to developers, providing them with information to resolve the

issue. "d-Tracker administers to the full life cycle of the issue, from its detection all the way through to its validation in being resolved," she said.

Completely Web-based, d-Tracker runs on Windows NT/2000 servers, according to Braum. Available immediately, cost is \$9,995 for a site license. ■

INSTANTIATIONS' JOVE 2.0 WORKS BETTER, COSTS LESS

Jove 2.0, Instantiations Inc.'s optimized native compiler for Java, features new performance output characteristics at a greatly reduced cost.

The new version effectively permits programmers to take Java class files, perform optimizations on them, incorporate an aggressive run-time environment and create an executable file for quick and easy deployment to servers and other systems.

New to Jove 2.0 is a more sophisticated optimization engine that performs whole-program, object-oriented optimization on Java programs; a new native compiler that reduces a Java program to a self-contained executable file that is binary compatible with the host operating system CPU; a new Jove console that provides either a Wizard or an Expert GUI with the Jove developer environment; and a scalable run-time environment providing native multithreading and multithreaded garbage collection.

Also new to 2.0 is the pricing structure. While Jove version 1.6 cost \$4,495, Jove 2.0 has been dramatically reduced to \$795, and all run-time fees have been eliminated, providing for unlimited deployment of customer applications created with Jove.

Jove 2.0 also supports Sun Microsystems Inc.'s JDK version 1.3. ■

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XML DevCon Fall 2000 Gears Up

BY CATHERINE EHR

The largest-ever contingent of XML professionals is expected at the XML DevCon 2000 Fall conference and exposition, to be held at the Doubletree Hotel in San Jose, Calif., from Nov. 12 to Nov. 15. XML DevCon 2000 promises to build on the success of the show held in June in New York and bring together XML professionals from all parts of the industry, including software programmers, developers, engineers and architects, along with system engineers, Web developers, product managers, project leaders and more.

The conference will offer an exhaustive array of technical courses; there are more than 100 hours of instruction scheduled for the three-day conference. Beginning Nov. 12 with 14 pre-conference tutorials, the sessions continue Monday through Wednesday, with more than 70 courses in six tracks available to attendees. Conference attendees can focus in on Wireless/Messaging, Middleware/Servers, Java/Scripting, Query/Schema/Database, Applied XML/eBiz or

Developer Techniques classes. In addition to the sessions held during regular conference hours, there will be Night School courses, to be held Sunday and Tuesday evenings. These courses cover eight XML

topics. Faculty members for the technical sessions are drawn from among the leaders in XML development: The list of instructors includes more than 100 XML experts.

Six keynote sessions, inclu-

ding a panel discussion on the future of software development and addresses by XML pioneers Tim Bray (co-editor of the XML specification) and Charles Goldfarb (the inventor of SGML and mark-up languages) are interspersed throughout Monday, Tuesday and Wednesday's programs. A reception on Monday

and a "Who Wants to be a Millionaire?"-style game show on Tuesday should add some levity to the conference. Contestants for the game show will be chosen from the audience. Attendees are welcome to submit questions to Stewart@Camelot-com.com. You'll get a prize if your question is used. ■

XML DEVCON FALL 2000

CONFERENCE:

Nov. 12-15, 2000

Doubletree Hotel, San Jose, Calif.

CONFERENCE HOURS:

Sunday: Registration, 8:00 a.m.-6:30 p.m.

Preconference Tutorials,
9:00 a.m.-12:30 p.m.; 2:00 p.m.-5:00 p.m.

Night School, 6:00 p.m.-7:00 p.m.

Monday: Registration, 7:00 a.m.-6:30 p.m.

Sessions, 9:35 a.m.-11:40 a.m.;
1:55 p.m.-4:05 p.m.

Welcome Reception, 5:00 p.m.-6:00 p.m.

Tuesday: Registration, 8:00 a.m.-6:00 p.m.

Sessions, 8:30 a.m.-10:35 a.m.;
1:55 p.m.-4:05 p.m.

Millionaire Game Show, 4:15 p.m.-5:00 p.m.

Night School, 5:30 p.m.-6:30 p.m.

Wednesday: Sessions, 9:30 a.m.-11:40 a.m.;
1:00 p.m.-4:15 p.m.

EXHIBIT HOURS:

Monday, Noon-6:30 p.m.

Tuesday, Noon-6:00 p.m.



KEYNOTE SESSIONS:

Monday: Keynote I, 8:40 a.m.-9:25 a.m.

Keynote II, 1:00 p.m.-1:45 p.m.

Keynote III, 4:15 p.m.-5:00 p.m.

Tuesday: Keynote Panel,

10:40 a.m.-11:40 a.m., "The Future of
Software Development: What and How"

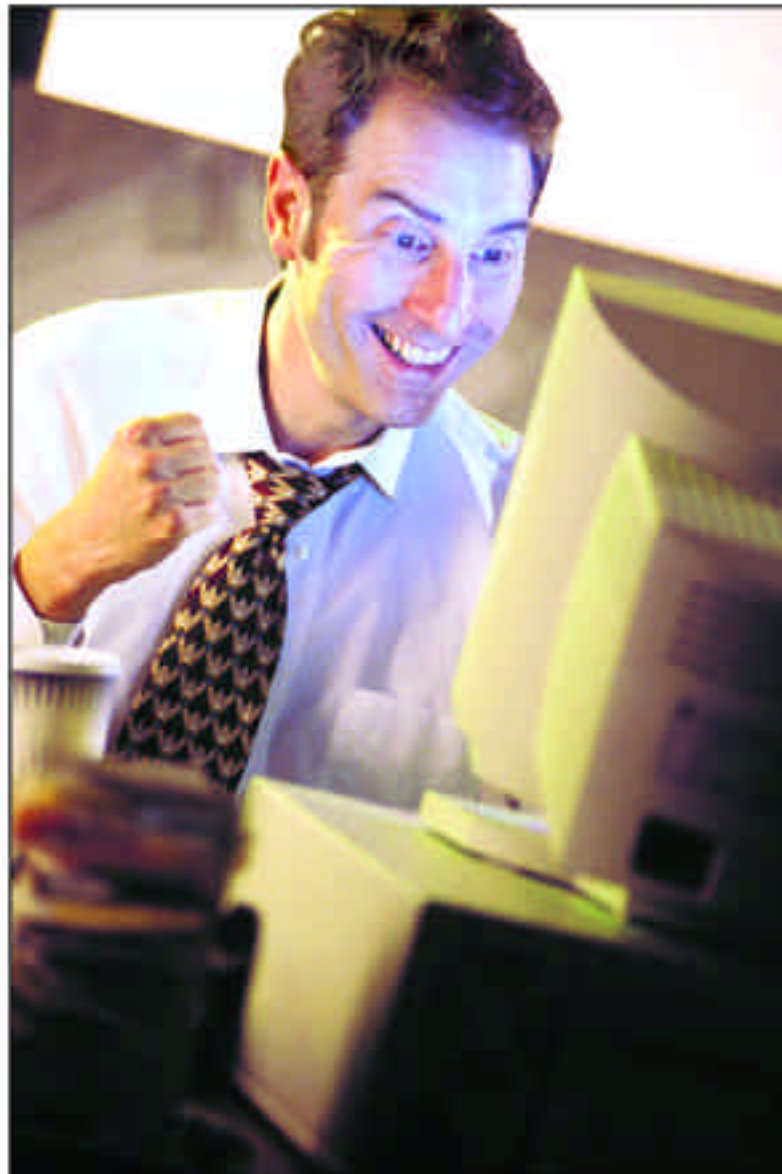
Keynote Presentation,

1:00 p.m.-1:45 p.m., Tim Bray,
"We're Not Finished Building the Web"

Wednesday: Keynote Speaker,

8:35 a.m.-9:20 a.m., Charles Goldfarb

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VISUAL BASIC: NOT DEAD YET

Despite Microsoft's intent to inexorably push its hordes of Visual Basic programmers toward the new C# platform, I don't see Visual Basic suddenly disappearing in a puff of smoke. Like most platform migrations, this move will happen slowly—especially considering that both languages are fairly Microsoft-centric. No point in angering your existing customer base by yanking the rug out from under them.

That means that Visual Basic will be hanging around for the near future. Indeed, Redmond has already announced that we'll be seeing new enhancements to Visual Basic in its next round of version upgrades, so there is obviously still life left in Visual Basic on the Microsoft campus.

For hard-core programming gurus, this really isn't important information. Visual Basic has never made many inroads with deep core coders due mainly to its orientation as an easy-to-use programming interface aimed at everyman. This ease-of-use mandate has taken its toll on Visual Basic, both in terms of flexibility as well as performance. The latter problem results most often from too much visual coding. Linking objects and functions in a unified workspace is certainly a simpler process to manage than syntax-style programming, but the "auto-code" that gets generated by the

system in the background is usually far from elegant or efficient.

That's why the hard-core programmer typically prefers IDE environments that are mostly wizard- and component-free. A straight syntax-based work environment bolstered by compilers, debuggers and linkages aimed specifically at this style of code-cutting is what counts to the propeller-cap set. But frankly, that's only one extreme.

It's easy for gurus to look down on the rest of us unwashed masses; they've taken the time and cultivated their talent to rise to such levels. But cutting code really isn't just for gurus in today's world. Plenty of mainstream power users or professional folks with other core skill sets often need the ability to create a little custom code on the side. And while elegance and efficiency are the Holy Grails of enterprise development, utility coding is really mostly about functionality.

Visual Basic's problem here is that while it's certainly easier to master than C++, it still represents a significant learning curve to nonprogrammers. This really isn't something you can pick up in just a week or two.

Enter SoftWire 2.0 for Visual Basic 6.0.

Built by SoftWire Technology (previously called Measurement Computing Corp.), SoftWire 2.0 is a graphical add-in for Visual Basic that really takes a solid shot at allowing nonprogrammers to quickly build working Visual Basic applications. The company touts SoftWire 2.0 as "no programming experience is required," and they've done a pretty solid job.

In effect, SoftWire provides Visual Basic users with the ability to program using code blocks. Programmers select the functionality they're looking for from a menu structure, and then place the corresponding objects in the standard Visual Basic workspace. SoftWire then lets them connect these objects with drag-and-drop "wires." Then just save/compile and the application's ready to run—without the developer having written a single line of code.

Even better, the tool can actually help neophytes learn how to program Visual Basic from a syntax perspective by allowing them to "walk" through their completed SoftWire application and showing them how the disparate Visual Basic code blocks work, including very nice explanations of how forms and property pages work.

More experienced Visual Basic programmers can also use SoftWire in a time-crunch situation. While this will force them to develop applications based on third-party components, Soft-

Wire has done an excellent job of providing a truly wide variety of functional and GUI-based reusable objects. Even better, these objects are all COM-based, so they can be integrated fairly easily into larger applications.

SoftWire's bundled component collection includes more than 130 code blocks that have recently been upgraded with new support for TCP/IP, arithmetic, financial and analysis functions. There are also new Excel functions, new database query and grid options and a full suite of TCP/IP communications controls.

Still, the \$495 SoftWire (www.softwire.com) isn't quite the coding utopia it claims. Developers still use third-party components connected via auto-generated plumbing. And, yes, this type of code is never as fast or reliable as is the stuff created by truly knowledgeable professionals. But it was certainly simple to use, and its ability to help teach Visual Basic syntax is a real bonus.

I wouldn't outfit every corporate end user with a copy for fear of being overwhelmed by newly minted mini-apps, but for members of a development team who don't have Visual Basic expertise, SoftWire can make them productive with the tool right away. ■

Oliver Rist is technical director of Grand Central Network, an Internet consulting company. He can be reached at orist@grand-central.net.

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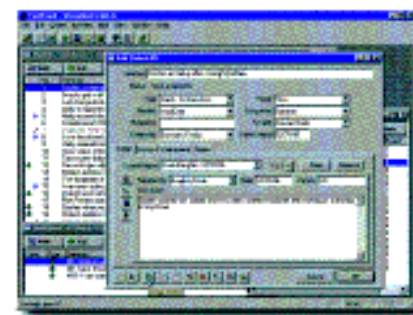
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COASE'S LAW

Will the last programmer to leave private industry please turn off the lights?

While the rise of the consulting programmer has attracted a good deal of attention, the forces at work that have already driven so many programmers to independence are only going to increase. As the type of manager or programmer who reads SD Times, you've already revealed enough about your level of engagement with your career to let me say with confidence that you will be an independent contractor within five years. No matter what the economy does. No matter how good your company's benefits programs are. No matter how many shares you have in your current option program.

In 1937, Ronald Coase's "The Nature of the Firm" proposed that transaction costs are the gravity that binds companies. A company will internally complete a task—writing a contract, booking travel, developing an e-business back end—if, and only if, doing so is cheaper for the company than completing the task externally. The calculation may not be formal, it may not even be conscious, but it is the basis for (fiscally responsible) organizational decisions. And by this calculus, SD Times readers are asteroids that no corporation can pull from orbit.

This is not, by any means, a prediction that corporate programming is doomed, nor even that corporate software engineering departments will be unpopulated in five years. But for today's better programmers and managers, they will be lonely places, filled with inexperienced youths honing their skills, clock watchers happy to contribute 20 hours of work for 40 hours of pay, and fresh parents whose workweek is a form of insurance premium against catastrophe.

Throw in a very few on the slide to retirement, and you have increasingly inefficient and depressing places—a portrait of Coase's Law in midlife.

An economic downturn, presumably inevitable in the long run, is irrelevant to this prediction. Short of the wide-scale abandonment of computers, demand will outstrip supply for talented programmers. The disparate cost of keeping good software developers on staff, already double and even triple typical staff costs (especially for young workers), will only rise. Unless a company feels that it derives strategic competitive advantage from maintaining these expensive developers, they will not meet the salary demands of those programmers.

"But companies do and will see their engineering staffs as keys to their competitive advantage," you protest. No they don't. They may see a software product or service as an advantage, they may recognize one or two visionaries and superstars as essential to building or extending that product, but they will increasingly come to understand that a superstar cannot execute without a team. And the creation and

retention of a high-performance team of great breadth and depth? Prohibitively expensive—for any company.

The eLancing sites—where programmers find free-lance assignments—aren't there yet. The difference between what they offer and what a good agency offers in the way of gigs and pay is enormous; I've met a lot of young programmers who don't return agents' calls when they shop their resumé around, which is a big mistake—a friendly and smart agent is a contract-seeker's best friend. (And the best friend of a software project manager, too—I'll talk more about that in a later column). But while agents are still the way to go for the best jobs, the eLancing sites are coming on strong with the best work-style offerings: health insurance, concierge services, even get-togethers to overcome the greatest downside to independent con-

sulting, which is the sense of transience surrounding work friendships.

The best people leave. This is the new rule of software team management. If you are an SD Times reader, you are in one of two categories: a software team manager or a developer who is going to be one. (How do I know that for certain? Because taking the time to stay abreast of the industry is a sign of leadership.) Learning to build and manage teams of your consultants is going to be one of the overarching challenges of your career in the next decade.

The best people leave. In doing so, they increase the cost of internally developing software. A company cannot afford to carry a team without the leadership of those who have left. Big consulting firms will lose their hegemony as talented managers and developers use eLancing technology to form virtual teams that can outperform the big firms while more equitably distributing the income (no more underpaid associates whose billings go to the millionaire partners). All inevitable, according to Coase's Law. No wonder they gave him a Nobel. ■

Larry O'Brien, the founding editor of Software Development Magazine, is a software engineering consultant based in San Francisco. He can be reached at lobrien@email.com.

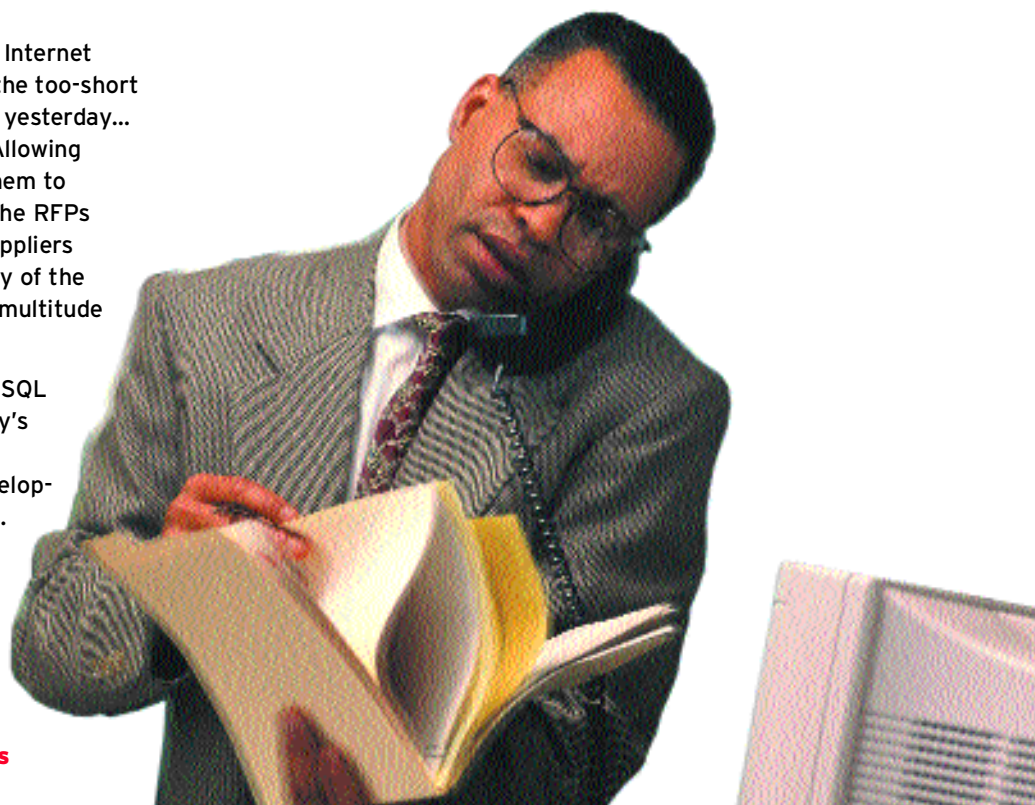


Meet the Database Developer's Boss

After all these years, he still gets a rush from entering the data center. As a database developer in the early 1980s, he cut his teeth on IBM System/370 mainframes and CICS. Today, the department he manages uses System/390s for heavy lifting, while also building new applications using a three-tiered model with Oracle running on Solaris on the back end.

The transition from dumb terminals to client/server to the Internet isn't as crazy as it seems. One thing that hasn't changed: the too-short deadlines. When the CIO wants a new feature, she wants it yesterday... and that's particularly true with the latest Web initiative. Allowing customers to read their account status is easy. Allowing them to update those records in real time is no picnic. That's why the RFPs he's been sending to middleware vendors stress that all suppliers have to provide solid mechanisms for ensuring the integrity of the primary customer database. Plus the ability to access the multitude of databases that have cropped up over the years.

The technical journals? He's long past the days of writing SQL queries or building tables – his job is to guide his company's progress by directing the development teams. He needs a wide-angle view of the entire spectrum of application development tools. Product road maps, not how-to tips and tricks. He needs to know the trends, the products, the alliances, the NEWS and what it all means. That's why he reads SD Times.





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REVISITING THE MIDDLEWARE LAYER MODEL

In the Aug. 15 issue ("The Middleware Layer Model," page 35), I suggested a layered model for networked applications that showed the various levels of interaction between them. A long-standing project of mine is to set down some kind of definition for middleware, and by providing a layered model and specifying that true middleware works only at layers 3, 4, and 5 (transport, connection and data, respectively), I hope to limit the discussion of middleware products.

Limit it, that is, to products whose primary mission is to enable applications hosted on different platforms to exchange data easily. Middleware is the enterprise plumbing for the distribution of data. Message-oriented middleware (MOM) is the purest expression of this definition, but certainly ORBs, transaction monitors and the combo shot of EJB, JMS and JTS would qualify as well.

Layered models were first introduced, I believe, with IBM's Systems Network Architecture (SNA). By the late 1970s, the International Standards Organization (ISO) had come up with the layered model just about everybody uses when discussing networks: the Open Systems Interconnect (OSI).

Since the OSI model was developed in the '70s, many people have thought it needed to be updated. Its lowest two lay-

ers in particular (the physical layer and the data-link layer) were thought of as one, so much so that experienced network managers could not tell you what exactly was the borderline between layer 1 and layer 2. Others argued there should be a layer 0 that would be the media itself, which should be distinguished from other physical link aspects. The bottom line is that as technology progressed, the areas of interest kept moving up the stack and the lower levels became increasingly less interesting and subject to the possibility of being compressed into fewer layers.

In my model, OSI layers 1 and 2 are collapsed into the physical layer. Basically if IP (or its equivalent) can run on it, then it is layer 1. I then progressed from there working up to the topmost application layer (which is also the highest level in the OSI stack).

Comes now Brian Whetten, the chief scientist at Talarian Corp., who points out that my proposed model is application oriented and that if the model wanted to capture infrastructure, it should reconsider the issue from a wholly new perspective. Whetten believes the future of networks is that companies will run software networks over their existing networks. This idea already finds its expres-

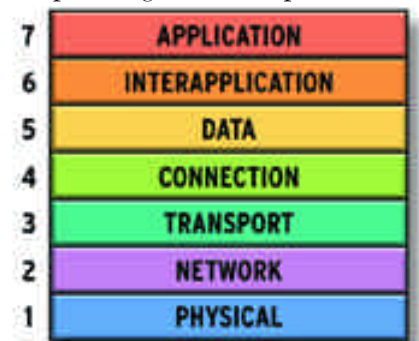
sion in the deployment of MOM. With MOM, companies commit to the MOM as the conduit and transport between apps. The actual network you and I are familiar with is the brick-and-mortar below the real MOM network.

In Whetten's model, the lower three layers of the OSI network (physical, data-link and network) form the single bottom layer of the stack. The OSI transport layer (layer 4, which includes things like TCP and RPCs, constitute his second layer. Together, these two layers are the real network that underlies the meta-network that rides above them. The meta-network (my term) consists of a network layer (content routing, multicast and other technologies that do some routing) and a transport layer that would consist of the messaging infrastructure of MOM. Above this meta-network would rest the application-oriented layers. These are the same ones as found in the OSI stack (session, which includes security; presentation, where data format translation occurs; and the application layer where EAI is performed as is the regular operation of applications).

While my model looks at the layering from an application's point of view (what are the necessary layers below the application?), Whetten's adopts the perspective of infrastructure (what are the layers of infrastructure that charac-

terize the enterprises of tomorrow?).

It is clear that Whetten is on to something; tomorrow (perhaps even today) enterprises will have to view their networks as data networks riding above physical networks—and each of these will have special and distinct needs. This view is possible only because of the enormous leaps in bandwidth and the sophistication of software that provide the plumbing in the enterprise.



Both Whetten's model and mine underscore how much technology has moved ahead in the past five years, and how critical it has become to replace the old and now rather insufficient OSI model with one that centralizes the role of middleware and interapplication communication. As we move forward, this view will have to become more familiar to us all. ■

Andrew Binstock is the principal analyst at Pacific Data Works LLC. Reach him at abinstock@pacificdataworks.com.

OPEN SOURCE CAF

I was still five states from home when I saw the reddish glow light up the sky ahead. I glanced at my watch, then remembered I'd lost it when I'd departed a hotel room hastily after a Linux conference had turned suddenly complicated. Anyway, it couldn't be long after 3 a.m.

The glow resolved into a neon sign as I approached. "Open Source Café." I turned into the lot without slowing down, the tires losing hold then grabbing in the loose gravel.

The greasy spoon gleamed like a bug zapper alongside the dark, deserted blacktop. I gave it the once-over through flyspecked plate glass. Jukebox in the corner, Formica counters, bright neon.

I took a booth alongside the window so I could keep an eye on the car. The bleach-blond waitress sighed as she made the trek to my table. She looked as tired as I felt, but I turned on the charm anyway. "Any specials I should know about?"

She stared at me for a minute, sizing me up and almost deciding not to bother. But something animal inside her caught the scent of e-business stock options on me. "Depends on what you like," she said, making a doomed effort to pat her hair into place.

I decided to level with her. "I'm not that hungry," I said. "I'm looking for information."

She gave me another appraising look

and slid into the booth. "Information isn't cheap," she said.

"Information wants to be free," I wisecracked. But she didn't laugh.

BLUE PLATE SPECIAL

"OK," she said, glancing around. "Are you tracking the apps?"

I shrugged. "Apps aren't interesting."

"Look again." She lowered her voice. "The Netscape 6 final beta is so solid it's going to put Netscape back into the browser game." I must have looked skeptical. "HTML 4.0, cascading style sheets 1, DOM, XML...try doing all that with Internet Explorer."

I wasn't impressed.

"StarOffice 5.2 is out, too—with integrated Palm support in Schedule, Discussion and Mail. You can grab the source code at www.openoffice.org and use chunks of it in your own apps. StarOffice 5.2 is beating Microsoft Office in some reviews."

"So what are you saying?" I ask. "That free software is going to capture market share? So what? Market share and a buck will get you a cup of coffee." I fix her with a look. "But apparently not in this joint."

She ignored my complaint. "Consider it validation of the open-source development model," she said. "As for the buck, it

just takes a new way of thinking. You need an open-source business model—which you may have to license from Red Hat."

I flicked her a question mark with my eyes.

"Remember all the hullabaloo when Al Gore claimed to have invented the Internet? Now Red Hat CTO Michael Tiemann is supposedly telling WR Hambrecht conference attendees that Red Hat started the open-source revolution."

"But that's—"

"Preposterous," she said. "Tiemann claims he really meant Cygnus, which is now part of Red Hat. Cygnus was founded in 1989, so it's arguably the first high-tech company with an open-source business plan."

I sighed impatiently.

CATCH OF THE DAY

"All right," she said, leaning in close so I wouldn't miss a word. "What do you hear about the LSB project?"

"Boot up, log on, tune—"

"Not LSD," she hissed. "LSB—the Linux Standards Base."

"Oh that," I said. "It's good stuff. Essential to prevent Linux from forking into multiple incompatible versions. The idea is that this industry consortium—the Free Standards Group—has created a technical document outlining the APIs and services of a base-level Linux implementation. Conforming implementa-

tions will present all the basic services of the operating system in compatible ways, so code will remain portable across distributions. It's an important project and all the big companies are behind it."

She nodded. "For now," she said, "but not for much longer."

She had my attention.

"The LSB project hasn't delivered anything but a mission statement and a vague outline of intent," the waitress said, snapping her gum. "The supporting organizations are starting to get impatient—LSB 1.0 will be a year out-of-date by the time it's done."

"That's a problem," I said.

"It's a disaster," she said. "Linux is morphing into incompatible dialects centered around embedded computing, Web servers and PDAs. Binary files can't be moved from distribution to distribution, and installation is getting harder, not easier. It makes Microsoft's 'DLL Hell' architecture look positively solid."

I took a minute to chew that over. "OK, that I can use," I said. "What do I owe you?"

She looked at me appraisingly. "Which way are you headed?"

I told her I was going east.

"Give me a minute to grab my pocketbook," she said. ■

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MIDDLEWARE WATCH

ANDREW BINSTOCK



OPEN SOURCE

J.D. HILDEBRAND

MICROSOFT LINUX... ALL BUT DONE

On the face of it, Microsoft's decision last month to resuscitate Corel with a \$135 million infusion of oxygen-rich capital is a simple win-win situation. Corel gets money and a new lease on life; Microsoft gets an ISV dedicated to developing applications for the .NET Framework.

Corel, which had been on life support since its failed merger with Inprise revealed a company strapped for cash, was left with a vague Linux strategy headed up by a CEO, Michael Cowpland, who left the company in August; and mature products such as Draw and WordPerfect that already had lost the fight for business application supremacy with Microsoft. So it gladly accepted the Microsoft investment, as it assumes preferred vendor status and gets an instant revenue stream for applications developed for the .NET platform. In its 8K filing with the Securities and Exchange Commission, Corel agrees to release its major-brand applications for the .NET Framework.

The payola for Microsoft? It gets a 24 percent nonvoting stake at around \$5 per share and, by propping up Corel, can show the Department of Justice that there is indeed competition in the market, much as it did with its investment in Apple when the creators of the MacOS were on the brink of elimination. The agreement also requires each side to drop any suits or claims it may have had against the other. Microsoft remains exposed to litigation from competitors in Corel's position, so \$135 million to Microsoft is less than what it would spend on lawyers to defend itself, and Corel gets the money now, instead of waiting for a settlement that wouldn't arrive until

after it had closed its doors.

But \$135 million doesn't come cheap. The real golden nugget for Microsoft can be found deep within the fine print of the 30-odd-page 8K filing by Corel. In an agreement on tech support, Corel gives Microsoft a three-year option to use Corel to port some or all of Microsoft's .NET Framework to Linux, using from Corel "at least 20 full-time developers and at least 10 full-time testers" for the full duration of the project. There's even a requirement that the final deliverables be ready within 12 months of Corel receiving the option notification from Microsoft.

MONEY WATCH



DAVID RUBINSTEIN

There you have it. Microsoft and Linux. It's a concept everyone we've spoken to in Redmond denies—"There's nothing to read into it," said Microsoft PR manager Tom Pilla—but with each move it makes, Microsoft inches closer to the open-source operating system. There is the WISE agreement with Mainsoft Corp., under which Microsoft licenses millions of lines of source code for the Windows operating system—source code Microsoft has fought so hard and spent so much to keep under wraps—to allow Microsoft applications to be ported to other platforms. Microsoft was quick to point out that Linux was not among the target platforms for the porting of Internet Explorer and Outlook; Mainsoft says the technology is ready and it is simply a matter of Microsoft making the decision to do so.

New Corel CEO Derek J. Burney suspects Microsoft will exercise the Linux option within the three-year time frame. "They can't ignore Linux too much longer," he said. Clearly, when Microsoft decides to throw the switch on

Linux, it wants to have an operating system and applications already in place.

According to Giga Information Group analyst Rob Enderle, .NET has to embrace other platforms or it doesn't fly. "Microsoft didn't want to have to dedicate resources" to develop a Linux strategy, he said.

For Corel's part, the cash allows the company to pursue its soon-to-be-defined strategy, of which Linux remains a big part. In fact, Burney said Corel Linux and Red Hat's implementation split half the retail-sales market. By all accounts, Corel will remain an independent company, free to pursue its own course—at least until Microsoft comes knocking for those developers and testers.

Corel would not indicate what percentage of its development staff would be lost to the Microsoft project, for which it will receive no further compensation, by the way. The company would say only that when that time arrives, either developers would be hired (good luck in this market!) or contract players would be brought in. Under either scenario, and despite Corel's protestations that it will remain its own company, the loss of that many experienced developers can only set back plans under its own agenda.

"I don't think Corel feels like Microsoft is looking over its shoulder," said Giga analyst Mike Gilpin, "but it certainly will take into account what Microsoft thinks about certain moves it might make."

Burney said Corel is "in the creative products business, regardless of platform. We'll be coming up with a corporate strategy in the next month or two."

One that will involve a closer relationship with Microsoft than anyone ever could have expected. ■

David Rubinstein is executive editor of SD Times.

ON THE INSIDE

In what had been written off as another unexplained meteorological anomaly, scientists looking for clues behind a gale wind that blew through Lexington, Mass., in mid-August have traced its origin to the headquarters of **Rational Software Corp.**, where employees were rushing to cash in stock options and sell off shares prior to the company's announced stock split. The bemused scientists quickly announced their study would end.

SVP Eric Schurr led the charge by selling 14,822 option-related shares at \$114.94 on Aug. 30. He acquired the shares at an average price of \$17 per share. SVP David H. Bernstein sold 5,600 option-related shares on Aug. 9 at \$101.75 after acquiring them at about \$29 per share, and SVP Joseph Marasco sold 20,000 shares on Aug. 14 at \$99.94 per share.

At **Sybase Inc.**, SVP Eric L. Miles sold 10,000 shares at about \$26 per share in transactions ended Aug. 31. VP Marty Healy sold 10,000 option-related shares on Aug. 29 at \$25 per share after acquiring them at an average price of \$6.30. SVP Terry Stephen sold 20,000 option-related shares on Aug. 7 at \$25.50 per share; he bought them at an average price of \$6.30 per share.

Justice Department wranglings could not corral the cash cow that is **Microsoft Corp.**, where SVP David Wayne Cole sold 63,600 option-related shares on Aug. 25 at \$71 per share; the shares were valued at \$4.63 when he received them. SVP Paul Henry Gross sold 25,000 option-related shares on Aug. 8 at \$74.44 after picking them up at \$16.56, and SVP William H. Neukom sold 60,000 option-related shares on Aug. 8 at \$73.33 per share; the acquisition price was \$12.05.



CALENDAR OF EVENTS

UML in the .com Enterprise Nov. 6-9

Wyndham Palm Springs Hotel
Palm Springs, CA

Registration fee is \$495 and includes all tutorials, workshops and lunch.

www.omg.org/news/meetings/uml/index.htm

XML DevCon Fall 2000 Nov. 12-15

Doubletree Hotel, San Jose, CA

All conferences, all days, \$1,595; any one day, \$650; any two days, \$1,200; night classes available.

www.xmldevcon2000.com

WebTek Nov. 27-29

The Toronto Board of Trade, Toronto

Seminar, conference and tutorials, \$1,395; conference and tutorials, \$1,295; conference only, \$895; tutorials only, \$595.

www.interdoc.ca/conference/webtekOTT2000/index.htm

Wireless DevCon 2000 Dec. 3-5

Doubletree Hotel, San Jose, CA

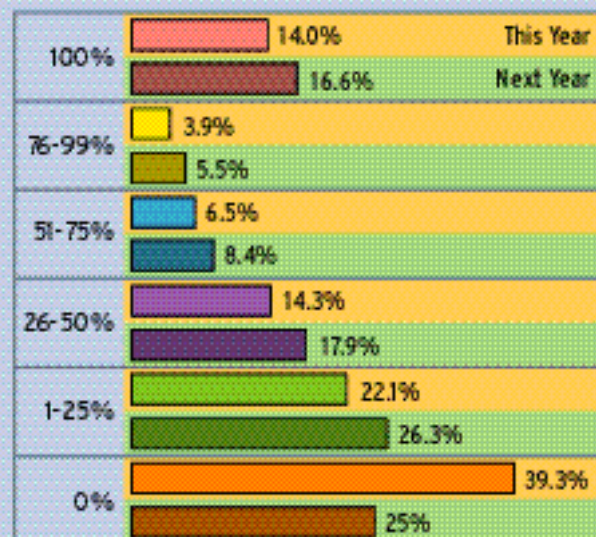
Two-day conference, \$1,295; any one day, \$675; night classes available.

www.wirelessdevcon2000.com

Know of an upcoming event that will interest developers or their managers? Let us know at events@bzmedia.com.

What Percentage of Apps Written By Linux Developers Are Open Source?

EVANS DATA WATCH



More than 60 percent of Linux developers today write open-source applications. Of those developers, 36 percent said that up to half of the applications they write are open source, and 14 percent said that all the applications they write are open source.

Linux developers surveyed indicate that open source is on the rise. They predict an increase in open-source applications written next year, to 75 percent of developers—a 25 percent increase over this year.

In addition, 44 percent of developers will write up to half of their applications as open source, an increase of 22.2 percent over this year. The number of developers that write only open-source applications is not expected to rise as dramatically. Next year, 16.6 percent of Linux developers expect to write only open-source applications, compared with the 14 percent that write only open-source applications today.

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Success!

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templates,
tools and
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advice for
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happy... and relieved.

My secret?

[gantthead.com]

solutions

experience

community

A hierarchical organizational chart is depicted against a textured blue background. At the top, a single hand points downwards. This hand is connected by a horizontal line to two more hands, representing a second level of the hierarchy. These two hands are further connected by horizontal lines to a total of five hands in the third level. The structure continues to branch out, with the leftmost branch having three more hands at the fourth level, and the rightmost branch having one hand at the fourth level. The hands are stylized, with fingers pointing in various directions, and are connected by thin black lines that form the organizational structure. The overall effect is a visual metaphor for a team or organizational structure.



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